TECHNICAL DRAINAGE STUDY

for

Area 1, Phases A & B

Golden Valley Ranch

Mohave County, AZ

Prepared for:

Rhodes Homes Arizona, LLC.

2215 Hualapai Mountain Rd., Suite H

Kingman, Arizona 86401

Stanley Consultants INC.

A Stanley Group Company
Engineering, Environmental and Construction Services - Worldwide

Technical Drainage Study

For

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Golden Valley Ranch
Mohave County, AZ

March 2006
SCI Project # 18449.00.00

Prepared for:

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2215 Hualapai Mountain Road, Suite H
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1. GENERAL LOCATION AND DEVELOPMENT DESCRIPTION

1.1. Introduction

This study is submitted as the technical drainage study for the proposed improvement plans of Area 1, Phases A & B of the Golden Valley Ranch residential development located in the Sacramento Valley of Mohave County, Arizona, more specifically on the south side of the Golden Valley Community, near Kingman. Area 1 comprises of approximately 187 acres of the total 5,800 acres of land located in the Golden Valley Ranch.

The purpose of this study is to evaluate the storm drainage infrastructure of the proposed development for Area 1, Phase A only. Phase B improvements will be submitted at a later date. Documentation for Phase B is included to provide continuity in the infrastructure improvements.

This study is divided into four separate areas of consideration. They are as follows:

- A general overview of site drainage
- A detailed analysis of the proposed storm drainage infrastructure.
- An analysis of the drainage improvements in the Public Right-of-Way.
- An evaluation of interim facilities serving the site

1.2. Location

The Golden Valley Ranch project site consists of Taxpin Numbers 215-01-048, 215-01-075, 215-01-078, 215-01-079, 215-01-080, 215-01-084, 215-01-085, 215-01-092, & 215-15-005 within Township 20 North, Range 18 West and Township 21 North, and Range 18 West, G&SRM, Mohave County, Arizona (Figure 1 - Vicinity Map and Regional Drainage Scheme).

1.3. FEMA Flood Hazard Zone

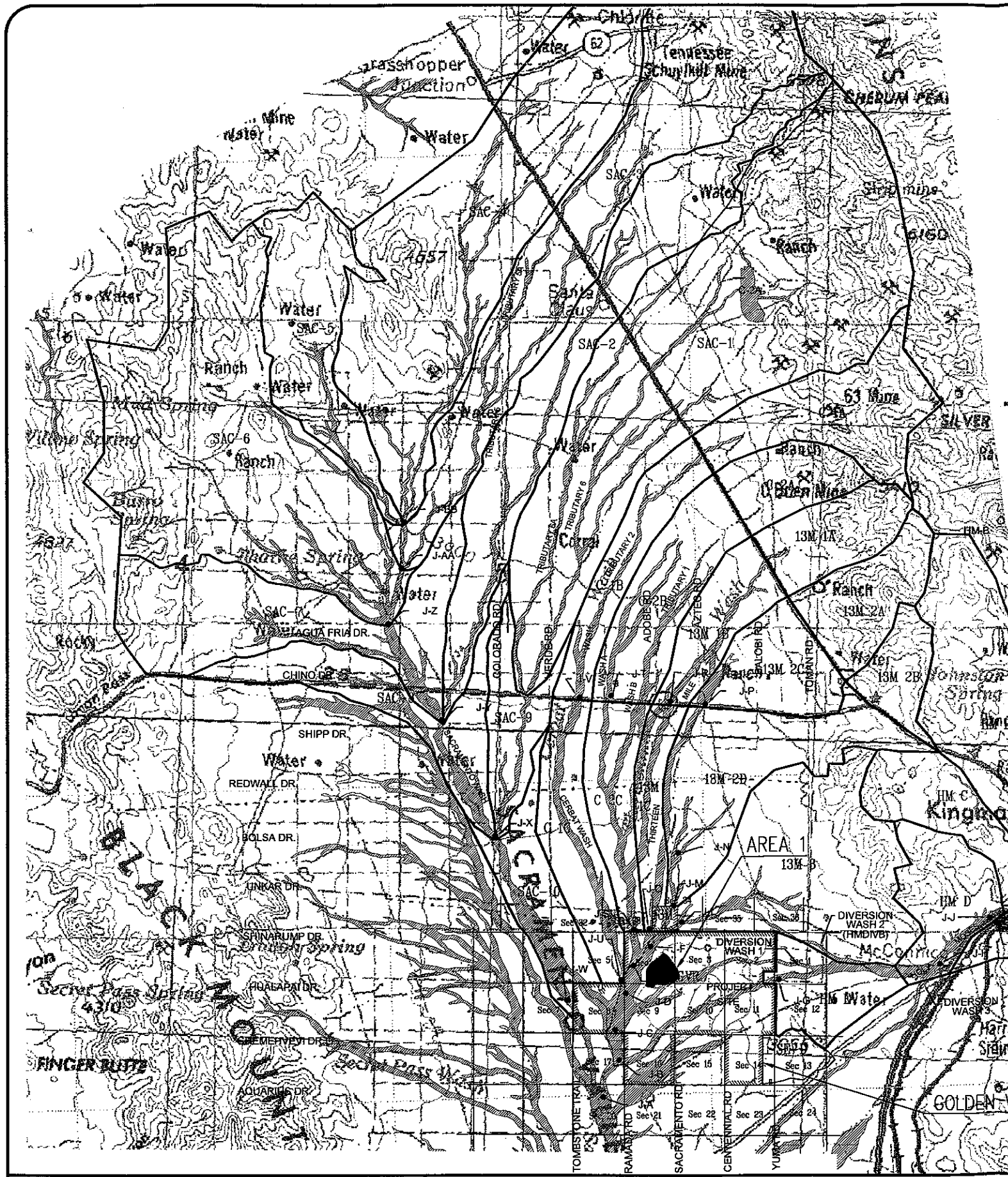
Figure 2 is a representation of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Mohave County, AZ, map number 040058 2325C, dated October 20, 2000. Of the 187 acres of Area 1, 25 acres lies in Special Flood Hazard Zone A.

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations (BFE's) or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

2. SITE DESCRIPTION

2.1. Description of Property

The property is semiarid rangeland with a covering of desert shrub in poor condition. Area 1, Phases A & B is located generally in the southwest quadrant of Section 4, Township 20 North, Range 18 West, G&SRM, with minor portions in Sections 3 and 9. The project will be

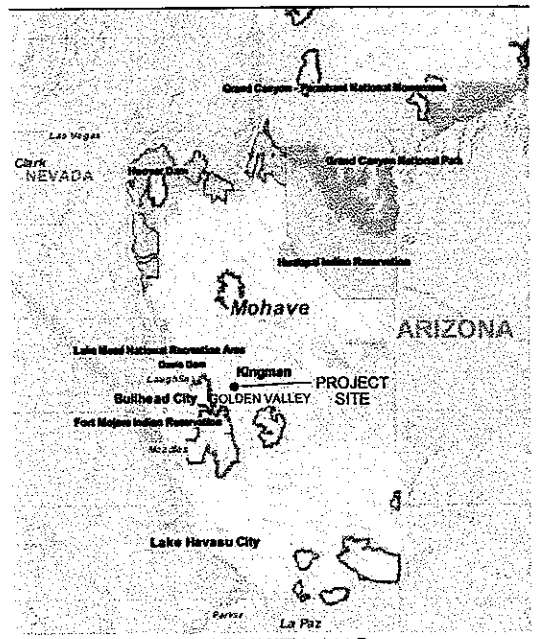


LEGEND:
- PROJECT BOUNDARY
- FEMA FLOOD PLAIN
- DRAINAGE SHED BOUNDARY
- DRAINAGE SUB-SHED BOUNDARY

DRAINAGE SHEDS
HM-A = HOLY MOSES WASH - DRAINAGE SHED A
13M-2B = THIRTEEN MILE WASH - TRIBUTARY 2, DRAINAGE SHED B
C-1C = CERBAT WASH - TRIBUTARY 1, DRAINAGE SHED C
J132B1 = JUNCTION THIRTEEN MILE WASH, TRIBUTARY 2, DRAINAGE SHED B, NODE 1

NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 6000ft.



VICINITY MAP
SCALE: NTS

GOLDEN VALLEY RANCH – WASH FLOW SUMMARY

(100yr., 24 hr PRECIPITATION)

BASIN/NODE	UPSTREAM AREA (Sq. Mi.)	SITED FLOW (CFS)	BASIN/NODE	UPSTREAM AREA (Sq. Mi.)	SITED FLOW (CFS)
HM-A	36.68	12,887	J-A	289.99	18,556
HM-B	11.68	7,668	J-B	136.79	9,862
HM-C	4.53	3,154	J-C	76.07	9,981
HM-D	4.44	2,042	J-D	67.37	8,261
HM-E	3.40	1,197	J-E	51.13	7,303
13M-4	0.25	242	J-F	38.04	6,457
13M-3	12.08	5,177	J-G	60.72	4,141
13M-2A	4.33	3,862	J-H	57.32	14,563
13M-2B	2.41	1,540	J-J	52.88	15,693
13M-2C	3.05	1,304	J-K	48.36	15,344
13M-2D	5.99	1,255	J-L	12.08	5,177
13M-1A	3.87	2,319	J-M	15.78	2,339
13M-1B	3.56	1,255	J-N	9.76	2,746
13M-1C	2.50	660	J-P	7.39	2,101
C2-A	3.31	2,184	J-Q	9.93	1,023
C2-B	6.00	1,687	J-R	7.43	1,321
C2-C	3.78	964	J-S	13.09	1,016
C1-A	7.12	3,913	J-T	9.31	1,690
C1-B	4.18	1,048	J-U	16.24	1,650
C1-C	4.94	1,035	J-V	11.29	2,452
SE-D	1.05	655	J-W	153.19	14,170
			J-X	149.13	14,670
			J-Y	105.13	12,436
			J-Z	80.69	11,890
			J-AA	55.04	9,265
			J-BB	33.50	6,188

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GOLDEN VALLEY SOUTH
VICINITY MAP AND REGIONAL DRAINAGE SCHEME
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY ARIZONA FIGURE 1

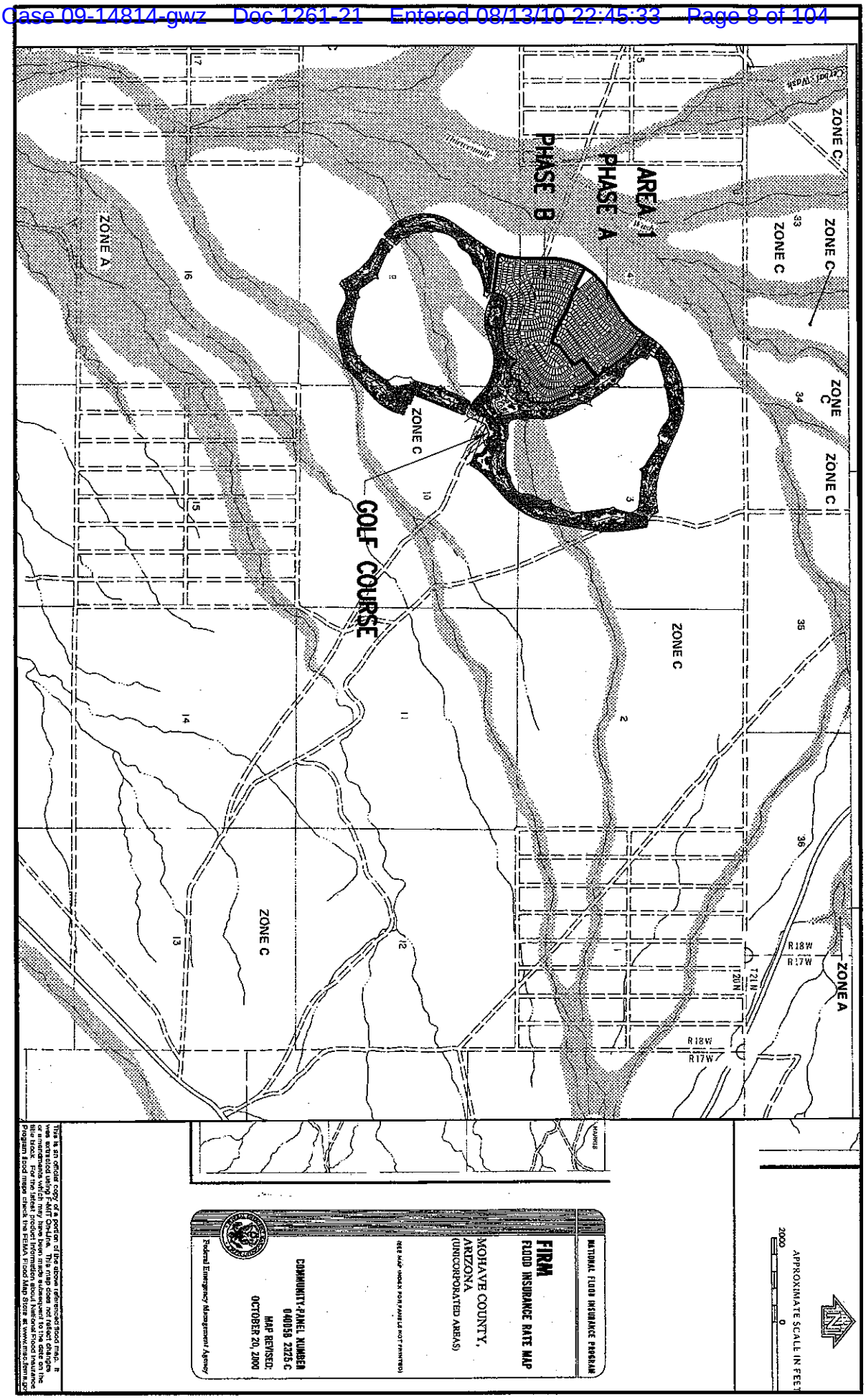
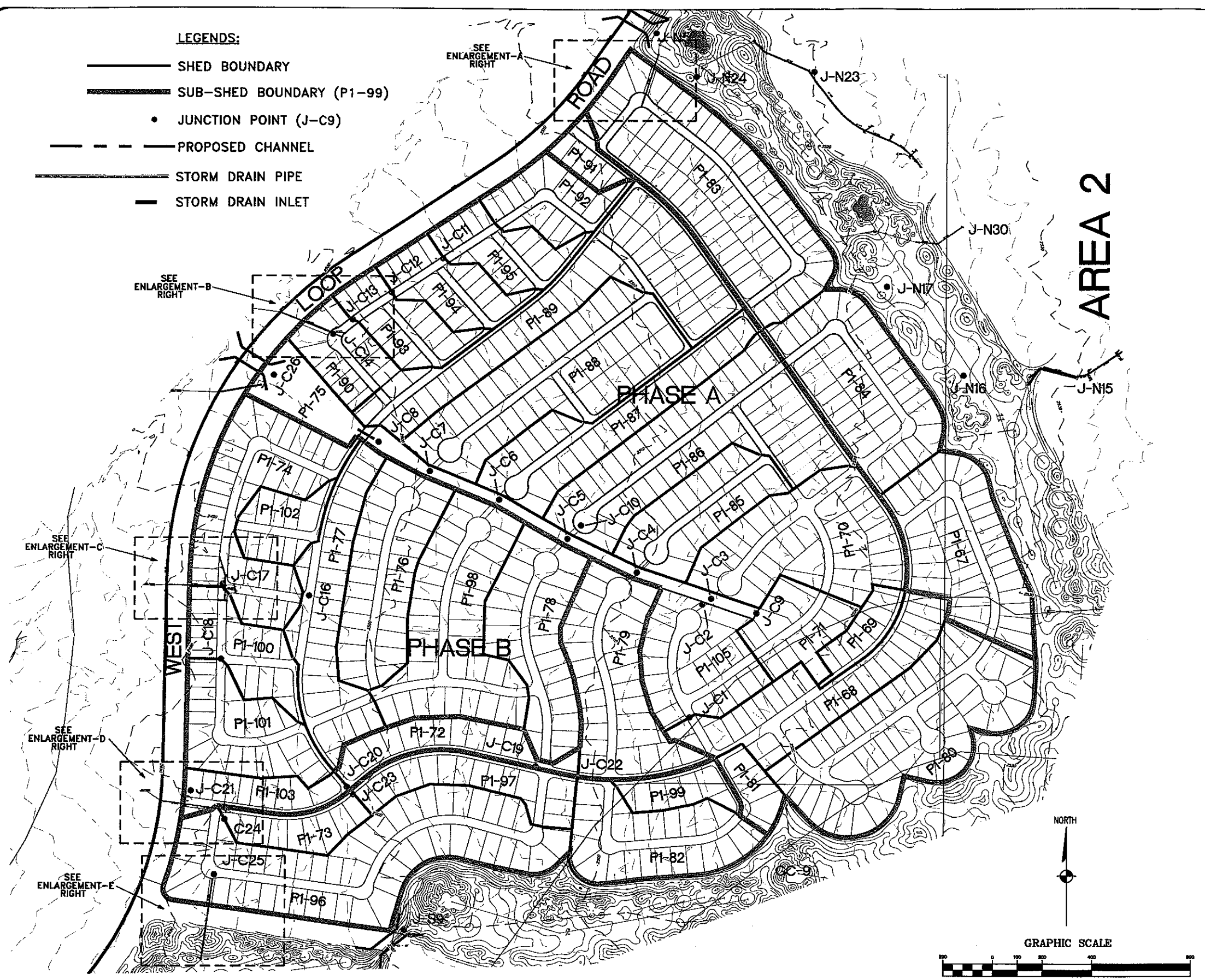


FIGURE 2
AREA 1

LEGENDS:

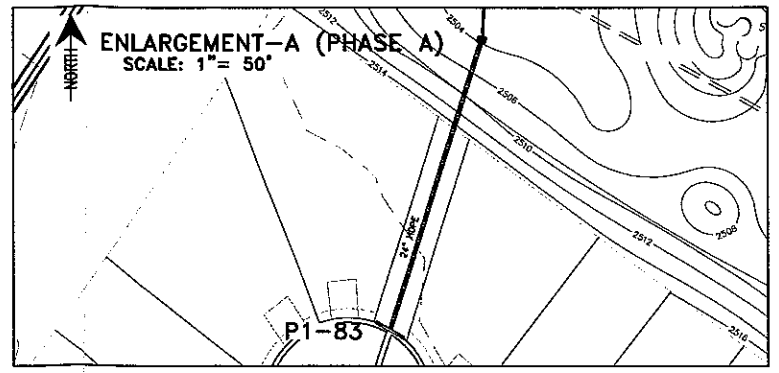
- SHED BOUNDARY
- SUB-SHED BOUNDARY (P1-99)
- JUNCTION POINT (J-C9)
- PROPOSED CHANNEL
- STORM DRAIN PIPE
- STORM DRAIN INLET

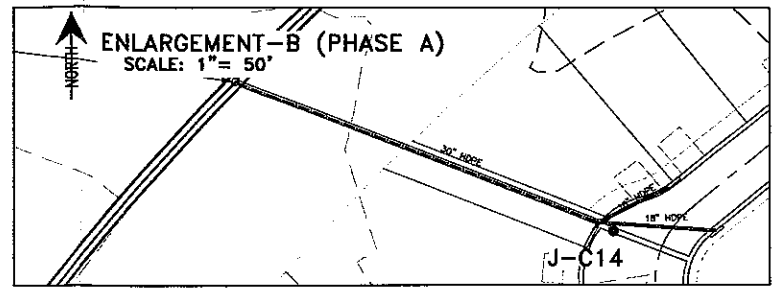


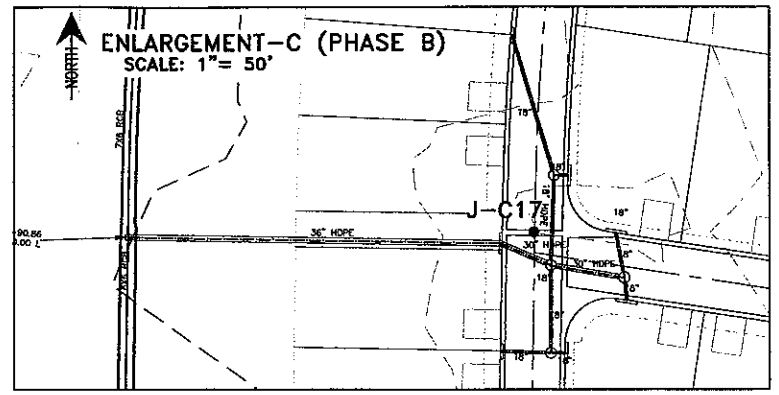
NORTH

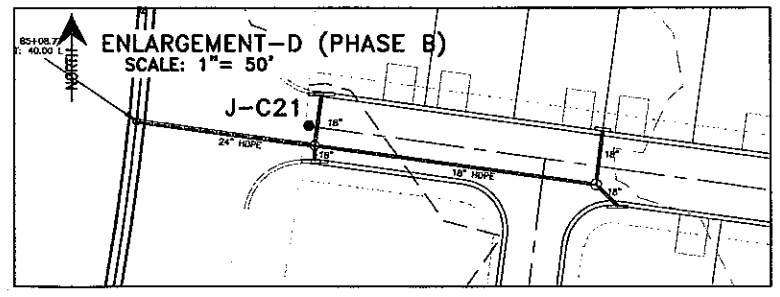
GRAPHIC SCALE

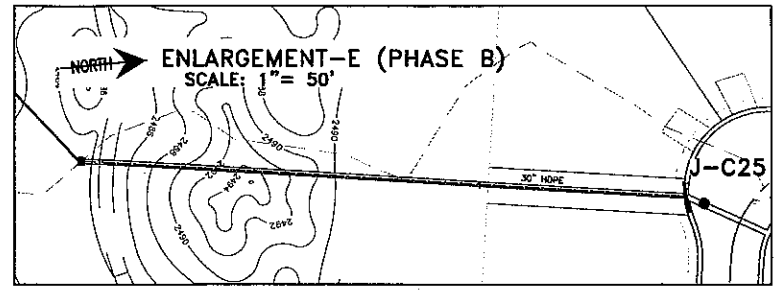
(IN FEET)
1 inch = 200 ft.











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GOLDEN VALLEY RANCH
AREA 1 DRAINAGE SUB-SHEDS
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY ARIZONA FIGURE 3

components. Each component models an aspect of the rainfall-runoff process within a portion of the whole basin. This basin portion is referred to as a sub-basin. The runoff hydrographs of each sub-basin are then combined and a final discharge hydrograph is obtained. It was chosen as the hydrology model since it is the model used in a Preliminary Federal Insurance Study prepared for Mohave County Flood Control District, October 2005 for various watersheds in the Golden Valley and Kingman, AZ area. This adds consistency and reliability in the methodology. Modified-Puls routing in the HEC-HMS model allows for retardation of peak flows within the broad flood way of the golf course.

HEC-RAS, another program from the COE, provides a steady state flow analysis to determine water surface elevations within a defined channel or flood plain. Volume computations within the HEC-RAS program were utilized in developing flow routing by Modified-Puls methods.

Water Surface Pressure Gradient (WSPG) program developed by the Los Angeles County Flood Control District. WSPG is a similar program to HEC-RAS in that it develops the water surface elevations and other channel parameters, but is better adapted to closed (pressure) conduit flow and is therefore used in the evaluation of the stormwater infrastructure system.

Calculations for street capacity are produced using the FlowMaster by Haestad Methods, Inc. Inlet calculations are performed using Federal Highway Administration's Visual Urban program for pavement drainage.

3.2. Drainage Shed and Modeling Convention

The basic naming convention of the basins for the exhibits and model are based around the individual drainage shed of the development. Sheds are labeled as P1-34, identifying Area 1, Shed 34. Junction points or points of runoff confluence are identified as J-C12, identifying that it is a junction point and a label. An R designates a routing of a shed or junction, therefore R-JN15 represents routing of junction JN15 to another point.

3.3. Design Storm and Precipitation

Local jurisdiction requires that water sheds less than 20 square miles be evaluated for the 6-hour local storm. Drainage sheds of 20 to 100 square miles are to be evaluated for both the 6-hour and 24-hour rainfall events. Areas from 20 square miles to 500 square miles are considered general storms and are evaluated for the 24-hour precipitation.

Maricopa County Flood Control District has developed storm distribution curves associated with drainage shed size. Since the total area of Area 1, Phases A & B is less than 1 square mile, Pattern 1 of the Maricopa County 6-Hour Mass Curve was utilized for the storm distribution. Precipitation values of 3.00-inches and 1.76-inches were taken from the National Oceanographic and Atmospheric Administration National Weather Service's Atlas 14. Table 4 provides the precipitation values from NOAA Atlas 14. Since the total area of Area 1 is 0.29 square miles (187 acres) the depth-area reduction factor was not applied.

Table 1 - Precipitation

Recurrence Interval (yrs)	5 min	10-min	15-min	30-min	1-hr	2-hr	3-hr	6-hr
10-yr	0.40	0.61	0.75	1.01	1.25	1.44	1.53	1.76
100-yr	0.65	0.98	1.22	1.64	2.03	2.44	2.67	3.00

3.4. Soils

Soils information is taken from the statewide coverage for Arizona, 2005, Natural Resources Conservation Service, Soil Data Mart. Soils within Area 1, Phases A & B consist of CACIQUE-BUCKLEBAR-ALKO (AZ039) type. These soils have a hydrologic soil type designation of "C".

3.5. Model Data and Results

Table 2 summarizes runoff at junction points and drainage sheds within Area 1, Phases A & B. Runoff values are rounded to the nearest 1 cfs.

Table 2 –Flow Summary

Element	Area (sq mi)	Peak Discharge 100-yr (cfs)	Peak Discharge 10-yr (cfs)	Element	Area (sq mi)	Peak Discharge 100-yr (cfs)	Peak Discharge 10-yr (cfs)
J-C01	0.0268	57	21	P1-67	0.0107	24	9
J-C02	0.0341	71	25	P1-68	0.0085	19	7
J-C03	0.0523	111	38	P1-69	0.0021	5	2
J-C04	0.0589	126	43	P1-70	0.0117	26	9
J-C05	0.0954	202	70	P1-71	0.0044	10	4
J-C06	0.1036	218	77	P1-72	0.0044	10	4
J-C07	0.1173	240	87	P1-73	0.003	7	3
J-C08	0.1311	266	97	P1-74	0.0105	24	9
J-C09	0.0065	15	6	P1-75	0.0067	7	1
J-C10	0.0365	76	28	P1-76	0.0089	20	7
J-C11	0.0087	20	7	P1-77	0.0087	20	7
J-C12	0.0131	30	11	P1-78	0.0087	20	7
J-C13	0.0172	39	14	P1-79	0.01	22	8
J-C14	0.021	47	17	P1-80	0.0165	37	13
J-C15	0.0213	48	18	P1-81	0.0018	4	2
J-C16	0.03	66	23	P1-82	0.008	18	7
J-C17	0.0548	120	42	P1-83	0.0174	39	14
J-C18	0.0112	25	9	P1-84	0.0115	26	10
J-C19	0.0187	42	15	P1-85	0.0066	15	6
J-C20	0.0231	50	17	P1-86	0.0143	31	11
J-C21	0.0263	54	19	P1-87	0.0082	18	7
J-C22	0.0104	23	9	P1-88	0.0137	30	11
J-C23	0.0154	33	12	P1-89	0.0138	27	10
J-C24	0.0184	37	12	P1-90	0.0038	9	3
J-C25	0.0363	73	23	P1-91	0.0017	4	1
J-C26	0.1378	242	90	P1-92	0.0044	10	4
J-C27	0.0222	49	18	P1-93	0.0041	10	4
				P1-94	0.0044	10	4
				P1-95	0.0043	10	4
				P1-96	0.0179	38	14
				P1-97	0.005	11	4
				P1-98	0.0124	28	10
				P1-99	0.0024	6	2
				P1-100	0.0046	11	4
				P1-101	0.0066	15	6
				P1-102	0.0031	7	3
				P1-103	0.0032	7	3
				P1-105	0.0073	17	6

It should be noted that the precipitation depths of the 100-yr, 6-hr event is 3-inches and that the precipitation depth of the 10-yr, 6-hr storm is 1.53-inches. The 100-yr precipitation is nearly twice for the 10-yr event. For the same events the amount of excess precipitation available for runoff is dependent on the runoff curve number, which is a function of soil type, land use, and antecedent moisture conditions. For this reason a larger portion of the 100-yr precipitation is available for runoff than for the smaller 10-yr storm and the ratio of peak runoff for the 100-yr precipitation to 10-yr precipitations is nearly 3.

All model results and input data are found in the Appendices of this study. They consist of the following:

- Appendix A – Model Results and Data provides the input parameters and results for Area 1, Phases A & B sheds.
- Appendix B – Drainage Infrastructure provides the storm drain inlet calculations open channel flow calculations through utility easements.
- Appendix C – Street Capacity Calculations
- Appendix D – Public Right-of-Way Drainage Improvements

4. Drainage Improvements within the Public Right-of-Way

Access to the project site is via Shinarump Road from the north to the new Aztec Road alignment and West Loop Road. Aztec Road will receive a culvert crossing at the Power line Easement to convey runoff from off-site areas to the Thirteen Mile Wash. The West Loop Road will have a pipe crossing from the Open Space area of Area 1, Phase 1 and convey this and other Area 1, Phases 1 & 2 runoff south, crossing a future portion of the West Loop Road and discharging into the golf course (See Figure 4). Discharge from Area 1, Phases A & B drainage sheds are discussed in Section 2.2.

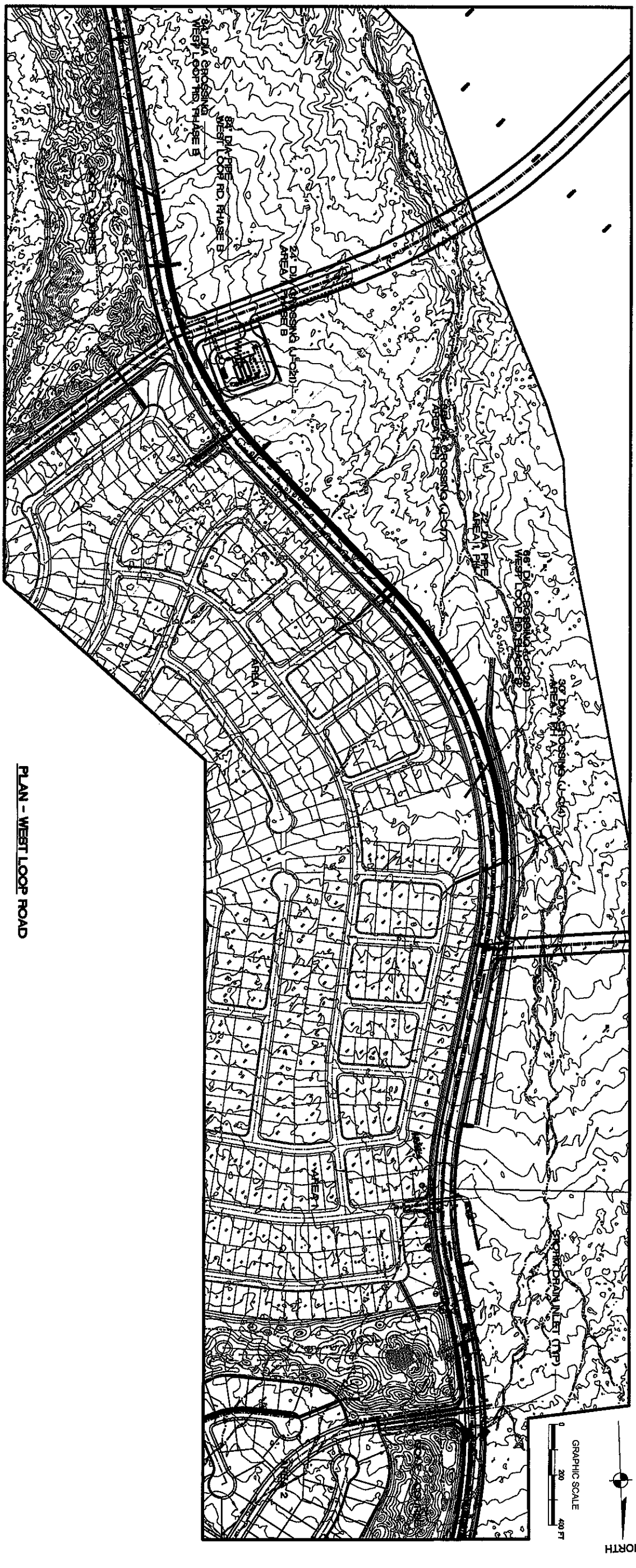
Appendix D contains street capacity calculations for the arterial roads and inlet capacity calculations.

5. Comparison of Flows

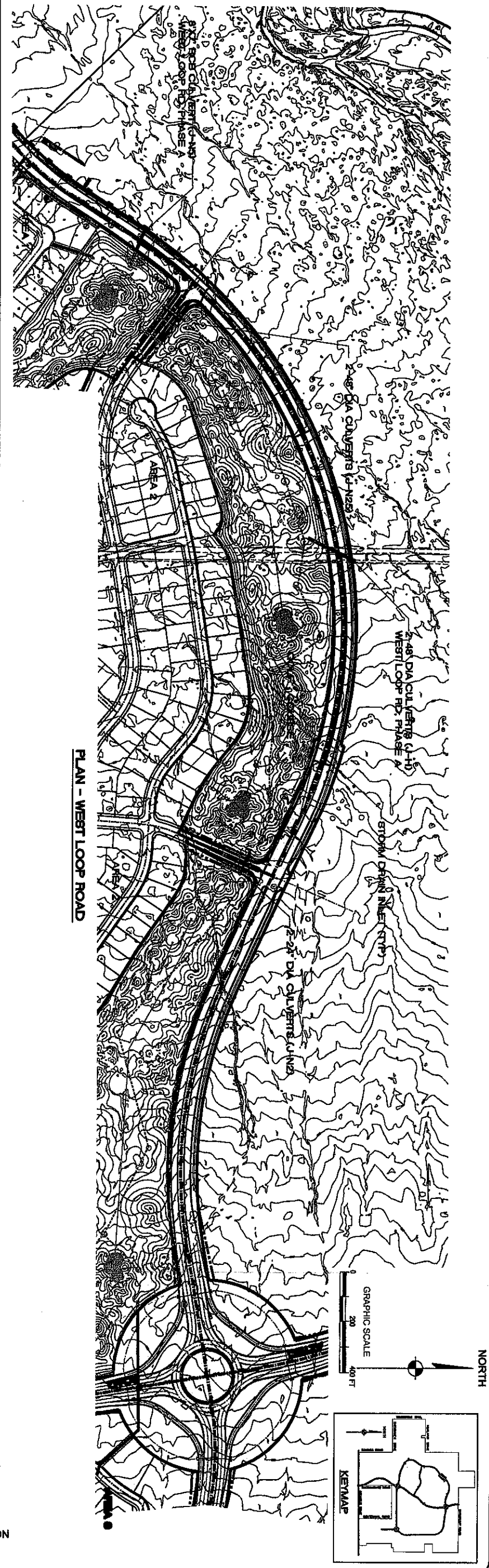
The drainage shed characteristics change with development of existing lands. The pervious soils that formerly existed become less pervious with the addition of houses, streets, and sidewalks and the time for runoff to reach its release point shortens. From a drainage point of view, one of the major advantages to the adjacent golf course is that drainage runoff is routed through its fairway system. This not only allows for runoff of the major storm events, but also allows for the golf course to absorb some for the runoff volume, therefore reducing the peak flow. Figure 5 shows existing drainage as it relates to the Area 1-3 development and outside areas that will drain through the proposed system. Table 3 provides a comparison of existing flows to developed flow at major junction points. Note that while runoff from the northern release point J-N5 exceeds its existing flow into the Thirteen Mile Wash, the collective flows from J-N5 and J-S26 is less than existing due to detention provided within the golf course.

Table 3 – Flow Comparison

Shed	Area (acres)	Indirect Methods (cfs)	HEC- HMS (cfs)
J-H	73.26	191	211
J3-44	18.12	73	38
J-S5	69.79	184	187
J-S9	439.35	657	456
J-N5	369.78	582	621
J-S26	713.82	916	798

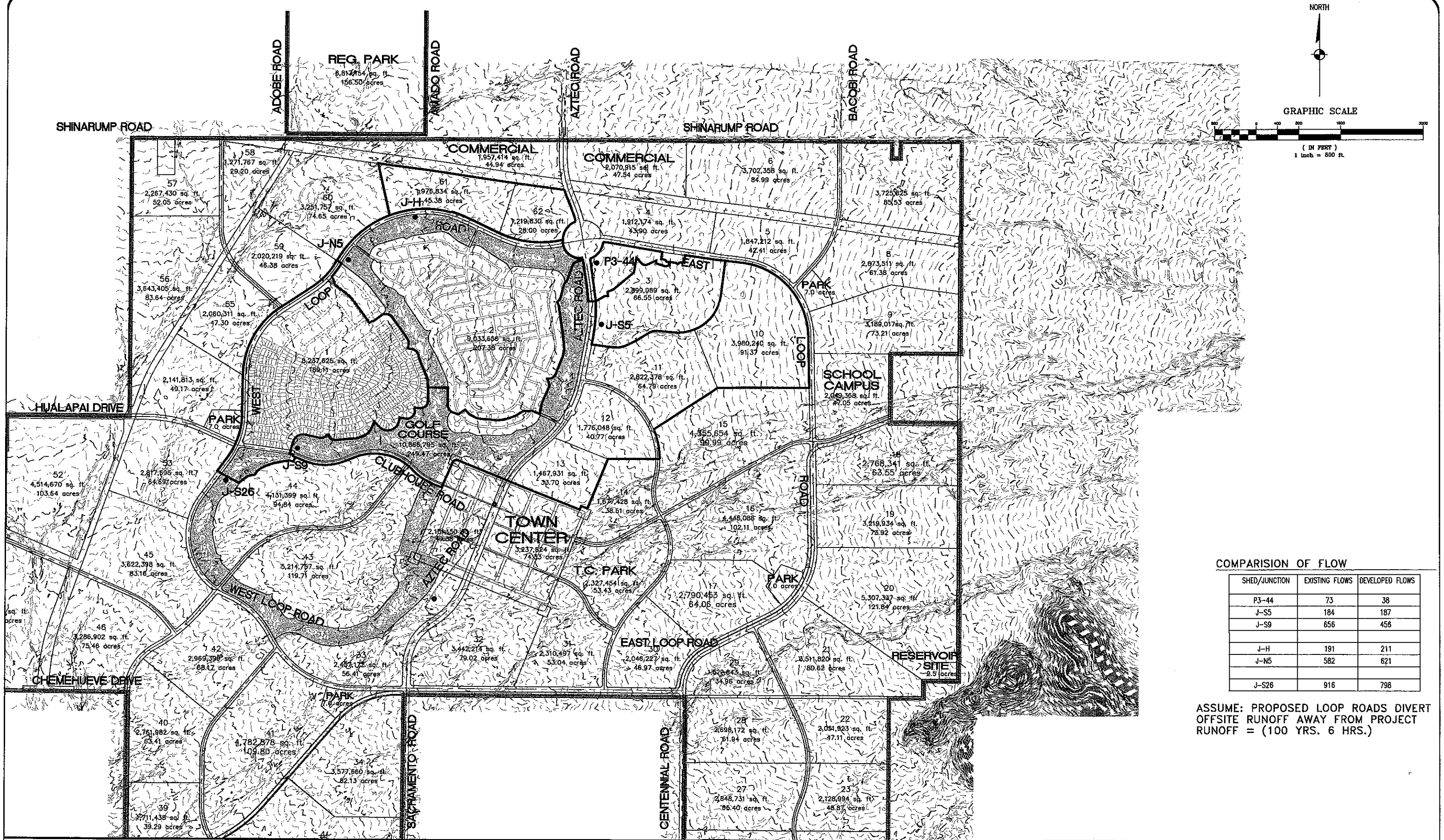


PLAN - WEST LOOP ROAD



PLAN - WEST LOOP ROAD

SHEET FIGURE 4	RHODES HOMES ARIZONA, LLC GOLDEN VALLEY RANCH WEST LOOP ROAD STORM DRAIN IMPROVEMENTS MOHAVE COUNTY ARIZONA	Stanley Consultants INC. 5820 S. Eastern Avenue, Suite 200 Las Vegas, Nevada 89119 (702) 369-9396 Fax (702) 369-9793 www.stanleygroup.com	SCALE (H) 1"=200' SCALE (V) DRAWN BY VND CHECKED BY MPB DATE 8/30/05
6 OF 40 SHEETS SCI PROJECT# 18448.0303			REV. NO. / DESCRIPTION / DRAWN BY / APPROVAL / DATE



COMPARISION OF FLOW

SHED/JUNCTION	EXISTING FLOWS	DEVELOPED FLOWS
P3-44	73	38
J-S5	184	187
J-S9	656	456
J-H	191	211
J-N5	582	621
J-S26	916	798

ASSUME: PROPOSED LOOP ROADS DIVERT OFFSITE RUNOFF AWAY FROM PROJECT RUNOFF = (100 YRS. 6 HRS.)

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GOLDEN VALLEY RANCH
EXISTING DRAINAGE AND PROPOSED OFFSITE IMPROVEMENTS
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY ARIZONA | FIGURE 5

6. FEMA Base Flood Elevations

The Holy Moses Diversion Wash #1 leaves the main channel east of the site. It travels in a westerly direction along the westerly sloping alluvial fan. The runoff generally remains within the washes banks, but as it reaches the channel edge it spills over into the surrounding dessert plain. Overtime the cresting and release of flow along with its sediment load has formed a channel with overbanks sloping away from the channel.

A HEC-RAS analysis provides the Base Flood Elevations (BFE) for this diversion wash. The base flood flow within Holy Moses Diversion Wash # 1 is based on derived flow from the Technical Drainage Study for Golden Valley Ranch, Mohave, Arizona, dated October 2005. Finish building grades are developed to remain 1 foot to 1.5 feet above the BFE. Figure 6 shows the BFE's for development in Areas 1-3.

7. SUMMARY

This study develops specific criteria and flow for the development of Area 1, Phases A & B.

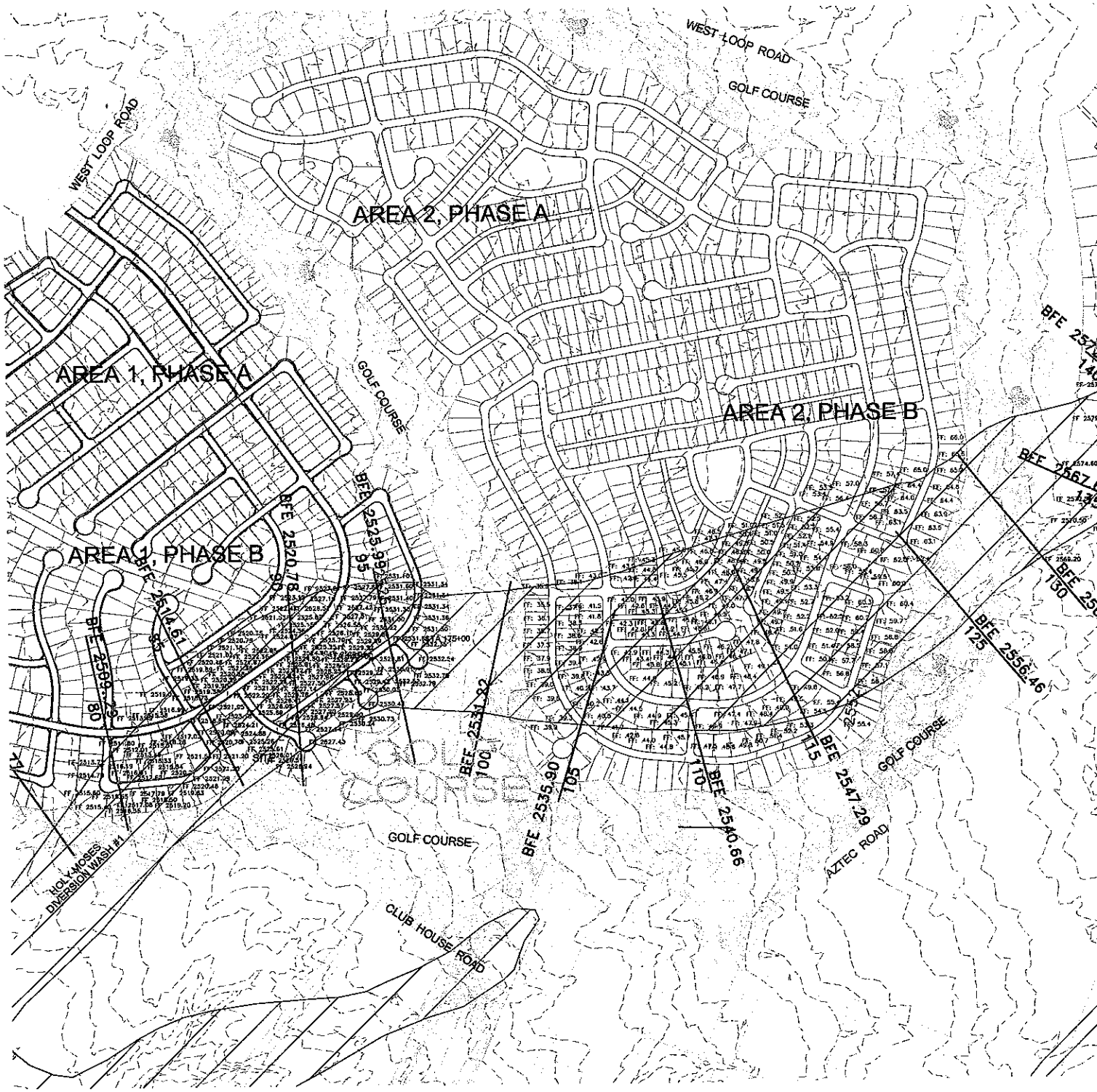
- The majority of the development runoff can be maintained and conveyed within the street right-of-way. Where street flow capacity is reached, a storm drainage system is required.
- The drainage infrastructure is capable of conveying the 10-yr, 6-hr storm event (minimum).
- The adjacent golf course services as runoff conveyance and storage.
- Total discharge from the collective Areas 1-3 to the Thirteen Mile Wash is less because of the use of runoff volume storage provided in the golf course.
- Conveyance of stormwater runoff within the golf course fairways allows for some ground water recharge.

8. REFERENCES

1) *Flood Insurance Rate Map*, Community Panel Number 040058 2325 C, Mohave County, Arizona, effective October 20, 2002.

2) *Highway Drainage Design Manual*, Arizona Department of Transportation, Report Number FHWA-AZ93-281, Final Report, March, 1993

3) *Drainage Design Manual for Maricopa County, Arizona*, Hydrology: Rainfall, Flood Control District of Maricopa County, November 2003



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APPENDIX A

AREA 1 – RESULTS AND DATA

- HEC-HMS 100-YR, 6-HR SIMULATION
- HEC-HMS 10-YR, 6-HR SIMULATION
- NOAA ATLAS 14 PRECIPITATION
- STANDARD FORM 4

Project: Pod1_S_curve Simulation Run: Pod1-100yr

Start of Run:	01Jan3000, 01:00	Basin Model:	POD 1
End of Run:	02Jan3000, 01:55	Meteorologic Model:	S-Pattern 1(3.00IN)
Execution Time:	15Mar2006, 11:16:57	Control Specifications:	Control 1

Volume Units: AC-FT

J-C1	0.0268	56.80	01Jan3000, 05:10	2.70
J-C10	0.0365	76.41	01Jan3000, 05:10	3.67
J-C11	0.0087	19.96	01Jan3000, 05:10	0.88
J-C12	0.0131	29.74	01Jan3000, 05:10	1.32
J-C13	0.0172	38.87	01Jan3000, 05:10	1.74
J-C14	0.0210	47.29	01Jan3000, 05:10	2.13
J-C15	0.0213	47.74	01Jan3000, 05:10	2.15
J-C16	0.0300	65.79	01Jan3000, 05:10	3.02
J-C17	0.0548	120.12	01Jan3000, 05:10	5.53
J-C18	0.0112	25.05	01Jan3000, 05:10	1.13
J-C19	0.0187	41.77	01Jan3000, 05:10	1.89
J-C2	0.0341	71.23	01Jan3000, 05:10	3.44
J-C20	0.0231	49.86	01Jan3000, 05:10	2.33
J-C21	0.0263	54.45	01Jan3000, 05:10	2.65
J-C22	0.0104	23.48	01Jan3000, 05:10	1.05
J-C23	0.0154	33.04	01Jan3000, 05:10	1.56
J-C24	0.0184	37.18	01Jan3000, 05:15	1.86
J-C25	0.0363	73.15	01Jan3000, 05:10	3.67
J-C26	0.1378	241.70	01Jan3000, 05:20	13.54
J-C27	0.0222	49.42	01Jan3000, 05:10	2.24
J-C3	0.0523	111.40	01Jan3000, 05:10	5.28
J-C4	0.0589	125.94	01Jan3000, 05:10	5.95
J-C5	0.0954	202.09	01Jan3000, 05:10	9.62
J-C6	0.1036	217.95	01Jan3000, 05:10	10.45
J-C7	0.1173	240.25	01Jan3000, 05:10	11.83

J-C8	0.1311	266.40	01Jan3000, 05:15	13.22
J-C9	0.0065	14.88	01Jan3000, 05:10	0.66
P1-100	0.0046	10.53	01Jan3000, 05:10	0.46
P1-101	0.0066	14.88	01Jan3000, 05:10	0.67
P1-102	0.0031	7.30	01Jan3000, 05:05	0.31
P1-103	0.0032	7.49	01Jan3000, 05:05	0.32
P1-105	0.0073	16.51	01Jan3000, 05:10	0.74
P1-67	0.0107	24.16	01Jan3000, 05:10	1.08
P1-68	0.0085	18.57	01Jan3000, 05:10	0.86
P1-69	0.0021	4.86	01Jan3000, 05:05	0.21
P1-70	0.0117	25.64	01Jan3000, 05:10	1.18
P1-71	0.0044	10.43	01Jan3000, 05:05	0.44
P1-72	0.0044	9.97	01Jan3000, 05:10	0.44
P1-73	0.0030	6.87	01Jan3000, 05:10	0.30
P1-74	0.0105	23.50	01Jan3000, 05:10	1.06
P1-75	0.0067	6.54	01Jan3000, 05:15	0.32
P1-76	0.0089	20.03	01Jan3000, 05:10	0.90
P1-77	0.0087	19.90	01Jan3000, 05:10	0.88
P1-78	0.0087	19.58	01Jan3000, 05:10	0.88
P1-79	0.0100	22.46	01Jan3000, 05:10	1.01
P1-80	0.0165	36.62	01Jan3000, 05:10	1.66
P1-81	0.0018	4.31	01Jan3000, 05:05	0.18
P1-82	0.0080	18.00	01Jan3000, 05:10	0.81
P1-83	0.0174	38.50	01Jan3000, 05:10	1.75
P1-84	0.0115	26.06	01Jan3000, 05:10	1.16
P1-85	0.0066	15.05	01Jan3000, 05:10	0.67
P1-86	0.0143	30.58	01Jan3000, 05:10	1.44
P1-87	0.0082	17.92	01Jan3000, 05:10	0.83
P1-88	0.0137	30.41	01Jan3000, 05:10	1.38
P1-89	0.0138	26.96	01Jan3000, 05:10	1.39
P1-90	0.0038	9.11	01Jan3000, 05:05	0.38
P1-91	0.0017	4.12	01Jan3000, 05:05	0.17

P1-92	0.0044	10.24	01Jan3000, 05:05	0.44
P1-93	0.0041	9.60	01Jan3000, 05:05	0.41
P1-94	0.0044	9.85	01Jan3000, 05:10	0.44
P1-95	0.0043	10.01	01Jan3000, 05:05	0.43
P1-96	0.0179	38.28	01Jan3000, 05:10	1.80
P1-97	0.0050	11.14	01Jan3000, 05:10	0.50
P1-98	0.0124	27.71	01Jan3000, 05:10	1.25
P1-99	0.0024	5.72	01Jan3000, 05:05	0.24
R-C-11	0.0087	19.89	01Jan3000, 05:10	0.88
R-JC1	0.0268	54.71	01Jan3000, 05:10	2.71
R-JC10	0.0365	76.14	01Jan3000, 05:10	3.68
R-JC12	0.0131	29.49	01Jan3000, 05:10	1.33
R-JC13	0.0172	38.63	01Jan3000, 05:10	1.75
R-JC15	0.0213	45.89	01Jan3000, 05:10	2.15
R-JC16	0.0300	64.39	01Jan3000, 05:10	3.03
R-JC19	0.0187	39.89	01Jan3000, 05:10	1.88
R-JC2	0.0341	70.98	01Jan3000, 05:10	3.44
R-JC20	0.0231	47.13	01Jan3000, 05:10	2.33
R-JC22	0.0104	22.94	01Jan3000, 05:15	1.05
R-JC23	0.0154	32.30	01Jan3000, 05:15	1.56
R-JC24	0.0184	37.14	01Jan3000, 05:15	1.87
R-JC27	0.0222	46.16	01Jan3000, 05:15	2.23
R-JC3	0.0523	110.89	01Jan3000, 05:10	5.28
R-JC4	0.0589	125.94	01Jan3000, 05:10	5.95
R-JC5	0.0954	200.03	01Jan3000, 05:10	9.62
R-JC6	0.1036	212.89	01Jan3000, 05:15	10.45
R-JC7	0.1173	240.28	01Jan3000, 05:15	11.83
R-JC8	0.1311	236.05	01Jan3000, 05:20	13.22
R-JC9	0.0065	14.85	01Jan3000, 05:10	0.66
R-P167	0.0107	23.35	01Jan3000, 05:10	1.08
R-P169	0.0021	4.83	01Jan3000, 05:10	0.21
R-P170	0.0117	25.57	01Jan3000, 05:10	1.18

Project: Pod1_S_curve Simulation Run: Pod1-10yr

Start of Run: 01Jan3000, 01:00 Basin Model: POD 1
End of Run: 02Jan3000, 01:55 Meteorologic Model: S-Pattern 1(1.53in)
Execution Time: 15Mar2006, 11:17:04 Control Specifications: Control 1

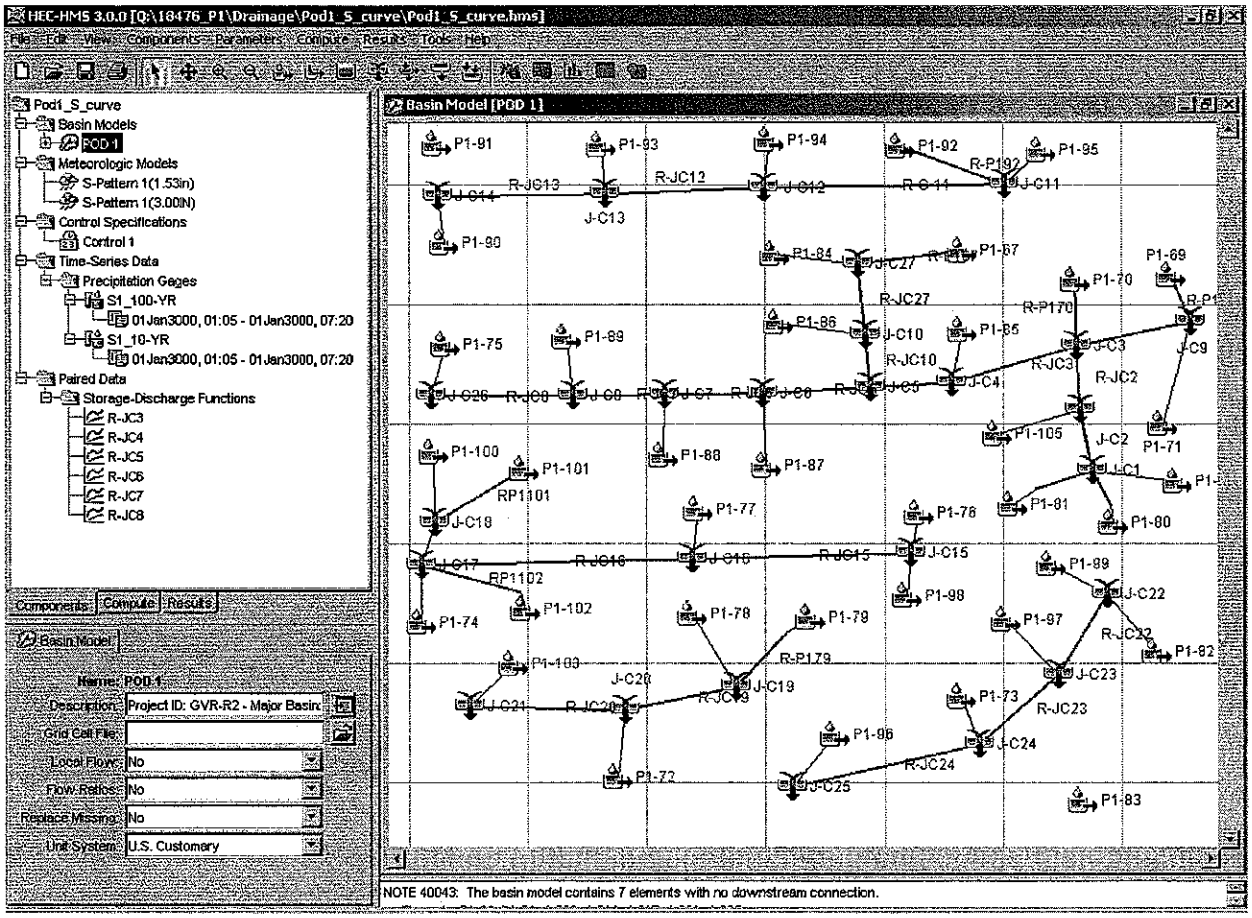
Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
J-C1	0.0268	20.66	01Jan3000, 05:15	0.94
J-C10	0.0365	27.56	01Jan3000, 05:15	1.27
J-C11	0.0087	7.45	01Jan3000, 05:10	0.30
J-C12	0.0131	10.89	01Jan3000, 05:10	0.46
J-C13	0.0172	14.15	01Jan3000, 05:10	0.60
J-C14	0.0210	17.15	01Jan3000, 05:10	0.74
J-C15	0.0213	17.58	01Jan3000, 05:10	0.74
J-C16	0.0300	23.39	01Jan3000, 05:10	1.04
J-C17	0.0548	42.48	01Jan3000, 05:10	1.91
J-C18	0.0112	9.11	01Jan3000, 05:10	0.39
J-C19	0.0187	15.28	01Jan3000, 05:10	0.65
J-C2	0.0341	25.08	01Jan3000, 05:15	1.19
J-C20	0.0231	17.44	01Jan3000, 05:15	0.80
J-C21	0.0263	19.28	01Jan3000, 05:15	0.91
J-C22	0.0104	8.72	01Jan3000, 05:10	0.36
J-C23	0.0154	11.68	01Jan3000, 05:15	0.54
J-C24	0.0184	12.18	01Jan3000, 05:20	0.64
J-C25	0.0363	23.28	01Jan3000, 05:15	1.26
J-C26	0.1378	90.05	01Jan3000, 05:20	4.63
J-C27	0.0222	17.81	01Jan3000, 05:10	0.77
J-C3	0.0523	37.66	01Jan3000, 05:15	1.83
J-C4	0.0589	42.59	01Jan3000, 05:10	2.06
J-C5	0.0954	69.83	01Jan3000, 05:15	3.33
J-C6	0.1036	76.88	01Jan3000, 05:15	3.62
J-C7	0.1173	86.58	01Jan3000, 05:15	4.10

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
J-C8	0.1311	96.50	01Jan3000, 05:15	4.58
J-C9	0.0065	5.55	01Jan3000, 05:10	0.23
P1-100	0.0046	3.95	01Jan3000, 05:10	0.16
P1-101	0.0066	5.50	01Jan3000, 05:10	0.23
P1-102	0.0031	2.68	01Jan3000, 05:10	0.11
P1-103	0.0032	2.76	01Jan3000, 05:10	0.11
P1-105	0.0073	6.12	01Jan3000, 05:10	0.25
P1-67	0.0107	8.95	01Jan3000, 05:10	0.37
P1-68	0.0085	6.76	01Jan3000, 05:10	0.30
P1-69	0.0021	1.81	01Jan3000, 05:10	0.07
P1-70	0.0117	9.35	01Jan3000, 05:10	0.41
P1-71	0.0044	3.80	01Jan3000, 05:10	0.15
P1-72	0.0044	3.70	01Jan3000, 05:10	0.15
P1-73	0.0030	2.58	01Jan3000, 05:10	0.10
P1-74	0.0105	8.65	01Jan3000, 05:10	0.37
P1-75	0.0067	1.04	01Jan3000, 05:15	0.06
P1-76	0.0089	7.40	01Jan3000, 05:10	0.31
P1-77	0.0087	7.46	01Jan3000, 05:10	0.30
P1-78	0.0087	7.23	01Jan3000, 05:10	0.30
P1-79	0.0100	8.29	01Jan3000, 05:10	0.35
P1-80	0.0165	13.42	01Jan3000, 05:10	0.57
P1-81	0.0018	1.55	01Jan3000, 05:10	0.06
P1-82	0.0080	6.65	01Jan3000, 05:10	0.28
P1-83	0.0174	14.09	01Jan3000, 05:10	0.61
P1-84	0.0115	9.67	01Jan3000, 05:10	0.40
P1-85	0.0066	5.61	01Jan3000, 05:10	0.23
P1-86	0.0143	11.05	01Jan3000, 05:10	0.50
P1-87	0.0082	6.52	01Jan3000, 05:10	0.29
P1-88	0.0137	11.15	01Jan3000, 05:10	0.48
P1-89	0.0138	9.61	01Jan3000, 05:15	0.48
P1-90	0.0038	3.28	01Jan3000, 05:10	0.13
P1-91	0.0017	1.48	01Jan3000, 05:05	0.06

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
P1-92	0.0044	3.80	01Jan3000, 05:10	0.15
P1-93	0.0041	3.54	01Jan3000, 05:10	0.14
P1-94	0.0044	3.62	01Jan3000, 05:10	0.15
P1-95	0.0043	3.71	01Jan3000, 05:10	0.15
P1-96	0.0179	13.84	01Jan3000, 05:10	0.62
P1-97	0.0050	4.09	01Jan3000, 05:10	0.17
P1-98	0.0124	10.19	01Jan3000, 05:10	0.43
P1-99	0.0024	2.07	01Jan3000, 05:10	0.08
R-C-11	0.0087	7.27	01Jan3000, 05:10	0.30
R-JC1	0.0268	20.24	01Jan3000, 05:15	0.94
R-JC10	0.0365	27.50	01Jan3000, 05:15	1.27
R-JC12	0.0131	10.61	01Jan3000, 05:10	0.46
R-JC13	0.0172	13.87	01Jan3000, 05:10	0.60
R-JC15	0.0213	16.46	01Jan3000, 05:15	0.74
R-JC16	0.0300	22.28	01Jan3000, 05:15	1.05
R-JC19	0.0187	14.53	01Jan3000, 05:15	0.65
R-JC2	0.0341	25.01	01Jan3000, 05:15	1.19
R-JC20	0.0231	17.35	01Jan3000, 05:15	0.80
R-JC22	0.0104	8.26	01Jan3000, 05:15	0.36
R-JC23	0.0154	10.95	01Jan3000, 05:20	0.54
R-JC24	0.0184	12.12	01Jan3000, 05:20	0.64
R-JC27	0.0222	17.52	01Jan3000, 05:15	0.78
R-JC3	0.0523	38.03	01Jan3000, 05:15	1.83
R-JC4	0.0589	42.56	01Jan3000, 05:10	2.06
R-JC5	0.0954	71.17	01Jan3000, 05:15	3.33
R-JC6	0.1036	77.18	01Jan3000, 05:15	3.62
R-JC7	0.1173	86.89	01Jan3000, 05:15	4.10
R-JC8	0.1311	89.04	01Jan3000, 05:20	4.58
R-JC9	0.0065	5.46	01Jan3000, 05:10	0.23
R-P167	0.0107	8.46	01Jan3000, 05:15	0.37
R-P169	0.0021	1.75	01Jan3000, 05:10	0.07
R-P170	0.0117	9.30	01Jan3000, 05:10	0.41

GOLDEN VALLEY RANCH



Precipitation

Time	100-yr, 6-hr	10-yr, 6-hr
01Jan3000, 01:05	0	0
01Jan3000, 01:20	0.024	0.012
01Jan3000, 01:35	0.048	0.024
01Jan3000, 01:50	0.075	0.038
01Jan3000, 02:05	0.099	0.05
01Jan3000, 02:20	0.123	0.063
01Jan3000, 02:35	0.15	0.077
01Jan3000, 02:50	0.174	0.089
01Jan3000, 03:05	0.198	0.101
01Jan3000, 03:20	0.222	0.113
01Jan3000, 03:35	0.261	0.133
01Jan3000, 03:50	0.297	0.151
01Jan3000, 04:05	0.354	0.181
01Jan3000, 04:20	0.414	0.211
01Jan3000, 04:35	0.648	0.33
01Jan3000, 04:50	1.131	0.577
01Jan3000, 05:05	2.502	1.276
01Jan3000, 05:20	2.733	1.394
01Jan3000, 05:35	2.793	1.424
01Jan3000, 05:50	2.85	1.454
01Jan3000, 06:05	2.886	1.472
01Jan3000, 06:20	2.916	1.487
01Jan3000, 06:35	2.949	1.504
01Jan3000, 06:50	2.973	1.516
01Jan3000, 07:05	3	1.53

Project:

6-Hour Design Storm Distribution

Stanley Consultants INC.
5820 S. Eastern Ave. Suite 200
Las Vegas, Nevada 89119
702.369.9396

Project: 0 Job No.: 0
Date: 0
Calculated by: 0

Modified STANDARD FORM 4 from the Clark County Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual

Stanley Consultants INC.
5820 S. Eastern Ave. Suite 200
Las Vegas, Nevada 89119
702.369.9396

			SCS Curve Numbers																									
			Curve Numbers								Sub-Basin Data			Initial/Overland Time (Ti)			Travel Time (Tt)					Tc Check (Urbanized Basins)		Final Tc	TLAG	HEC-INPUT		Remarks
Drainage Basin Name	Drainage Area (Acres)	Drainage Area (Sq. Mi.)	Cover Type and Hydrologic Condition	Curve # for Hydrologic Soils Group A	B	C	D	Composite CN	Designation	K (Default by CN)	Area (Acres)	Length (feet)	Slope (%)	Ti (Min)	Length (feet)	Slope (%)	V1 (FPS) (Manning)	V2 (FPS) (Manning)	Tt (Min)	Total Length (feet)	Tc= (L/180)+10 (Min)	Tc = Ti+Tt (Min)	(Tc*0.6) (Min)	Composite CN	Drainage Area (Sq. Mi.)	Tc>=10 for Non Urban Tc>=5 for Urban
				(1)					(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(Min)			
DEVELOPED CONDITIONS									DEVELOPED CONDITIONS																	
P1- 67	6.8206	0.0107	7,000 +/- resudebtuak kits	76	84	89	91	89	67	0.78	6.82	130	1.00	6.47	887	0.01	0.17	0.25	75.79	1017	15.7	15.7	9.4	89	0.0107	
P1- 68	5.4398	0.0085	7,000 +/- resudebtuak kits	76	84	89	91	89	68	0.78	5.44	170	1.00	7.40	1232	0.01	0.17	0.26	96.54	1402	17.8	17.8	10.7	89	0.0085	
P1- 69	1.3328	0.0021	7,000 +/- resudebtuak kits	76	84	89	91	89	69	0.78	1.33	130	1.00	6.47	468	0.01	0.21	0.31	37.74	598	13.3	13.3	8.0	89	0.0021	
P1- 70	7.4739	0.0117	7,000 +/- resudebtuak kits	76	84	89	91	89	70	0.78	7.47	130	1.00	6.47	1240	0.01	0.20	0.30	82.56	1370	17.6	17.6	10.6	89	0.0117	
P1- 71	2.7841	0.0044	7,000 +/- resudebtuak kits	76	84	89	91	89	71	0.78	2.78	160	1.00	7.18	318	0.01	0.21	0.32	25.01	478	12.7	12.7	7.6	89	0.0044	
P1- 72	2.8299	0.0044	7,000 +/- resudebtuak kits	76	84	89	91	89	72	0.78	2.83	140	1.00	6.71	817	0.01	0.17	0.25	71.32	957	15.3	15.3	9.2	89	0.0044	
P1- 73	1.9464	0.0030	7,000 +/- resudebtuak kits	76	84	89	91	89	73	0.78	1.95	120	1.00	6.22	569	0.01	0.19	0.29	47.09	689	13.8	13.8	8.3	89	0.0030	
P1- 74	6.7233	0.0105	7,000 +/- resudebtuak kits	76	84	89	91	89	74	0.59	6.72	120	1.00	10.12	1038	0.01	0.20	0.30	71.18	1158	16.4	16.4	9.9	89	0.0105	
P1- 75	4.2618	0.0067	Open space/parks - good	39	61	74	80	74	75	0.59	4.26		1.00	0.00	2240	0.01	0.23	0.34	121.23	2240	22.4	22.4	13.5	74	0.0067	
P1- 76	5.7100	0.0089	7,000 +/- resudebtuak kits	76	84	89	91	89	76	0.78	5.71	160	1.00	7.18	925	0.01	0.15	0.22	88.49	1085	16.0	16.0	9.6	89	0.0089	
P1- 77	5.5474	0.0087	7,000 +/- resudebtuak kits	76	84	89	91	89	77	0.78	5.55	120	1.00	6.22	602	0.01	0.21	0.32	44.71	722	14.0	14.0	8.4	89	0.0087	
P1- 78	5.5774	0.0087	7,000 +/- resudebtuak kits	76	84	89	91	89	78	0.78	5.58	150	1.00	6.95	941	0.01	0.16	0.24	84.61	1091	16.1	16.1	9.6	89	0.0087	
P1- 79	6.4257	0.0100	7,000 +/- resudebtuak kits	76	84	89	91	89	79	0.78	6.43	110	1.00	5.95	990	0.01	0.18	0.28	74.20	1100	16.1	16.1	9.7	89	0.0100	
P1- 80	10.5554	0.0165	7,000 +/- resudebtuak kits	76	84	89	91	89	80	0.78	10.56	120	1.00	6.22	1144	0.01	0.18	0.28	84.21	1264	17.0	17.0	10.2	89	0.0165	
P1- 81	1.1797	0.0018	7,000 +/- resudebtuak kits	76	84	89	91	89	81	0.78	1.18	130	1.00	6.47	286	0.01	0.24	0.36	20.21	416	12.3	12.3	7.4	89	0.0018	
P1- 82	5.1252	0.0080	7,000 +/- resudebtuak kits	76	84	89	91	89	82	0.78	5.13	130	1.00	6.47	952	0.01	0.23	0.35	56.81	1082	16.0	16.0	9.6	89	0.0080	
P1- 83	11.1513	0.0174	7,000 +/- resudebtuak kits	76	84	89	91	89	83	0.78	11.15	100	1.00	5.67	1186	0.01	0.18	0.27	89.75	1286	17.1	17.1	10.3	89	0.0174	
P1- 84	7.3870	0.0115	7,000 +/- resudebtuak kits	76	84	89	91	89	84	0.78	7.39	135	1.00	6.59	821	0.01	0.19	0.28	64.07	956	15.3	15.3	9.2	89	0.0115	
P1- 85	4.2336	0.0066	7,000 +/- resudebtuak kits	76	84	89	91	89	85	0.78	4.23	120	1.00	6.22	726	0.01	0.20	0.30	53.79	846	14.7	14.7	8.8	89	0.0066	
P1- 86	9.1332	0.0143	7,000 +/- resudebtuak kits	76	84	89	91	89	86	0.78	9.13	130	1.00	6.47	1474	0.01	0.21	0.32	88.86	1604	18.9	18.9	11.3	89	0.0143	
P1- 87	5.2466	0.0082	7,000 +/- resudebtuak kits	76	84	89	91	89	87	0.78	5.25	120	1.00	6.22	1294	0.01	0.21	0.32	80.95	1414	17.9	17.9	10.7	89	0.0082	
P1- 88	8.7552	0.0137	7,000 +/- resudebtuak kits	76	84	89	91	89	88	0.78	8.76	120	1.00	6.22	1147	0.01	0.19	0.29	81.92	1267	17.0	17.0	10.2	89	0.0137	
P1- 89	8.8033	0.0138	7,000 +/- resudebtuak kits	76	84	89	91	89	89	0.78	8.80	130	1.00	6.47	2026	0.01	0.21	0.32	119.90	2156	22.0	22.0	13.2	89	0.0138	
P1- 90	2.4103	0.0038	7,000 +/- resudebtuak kits	76	84	89	91	89	90	0.78	2.41	140	1.00	6.71	290	0.01	0.21	0.31	23.53	430	12.4	12.4	7.4	89	0.0038	
P1- 91	1.0850	0.0017	7,000 +/- resudebtuak kits	76	84	89	91	89	91	0.78	1.09	120	1.00	6.22	231	0.02	0.27	0.41	14.13	351	12.0	12.0	7.2	89	0.0017	
P1- 92	2.8095	0.0044	7,000 +/- resudebtuak kits	76	84	89	91	89	92	0.78	2.81	140	1.00	6.71	436	0.01	0.17	0.26	42.66	576	13.2	13.2	7.9	89	0.0044	
P1- 93	2.6487	0.0041	7,000 +/- resudebtuak kits	76	84	89	91	89	93	0.78	2.65	130	1.00	6.47	400	0.01	0.15	0.23	44.50	530	12.9	12.9	7.8	89	0.0041	
P1- 94	2.8118	0.0044	7,000 +/- resudebtuak kits	76	84	89	91	89	94	0.78	2.81	120	1.00	6.22	1054	0.01	0.15	0.23	96.29	1174	16.5	16.5	9.9	89	0.0044	
P1- 95	2.7271	0.0043	7,000 +/- resudebtuak kits	76	84	89	91	89	95	0.78	2.73	130	1.00	6.47	430	0.01	0.18	0.27	40.50	560	13.1	13.1	7.9	89	0.0043	
P1- 96	11.4480	0.0179	7,000 +/- resudebtuak kits	76	84	89	91	89	96	0.78	11.45	140	1.00	6.71	1459	0.01	0.23	0.35	82.80	1599	18.9	18.9	11.3	89	0.0179	
P1- 97	3.2162	0.0050	7,000 +/- resudebtuak kits	76	84	89	91	89	97	0.78	3.22	130	1.00	6.47	1103	0.01	0.20	0.31	73.21	1233	16.9	16.9	10.1	89	0.0050	
P1- 98	7.9597	0.0124	7,000 +/- resudebtuak kits	76	84	89	91	89	98	0.78	7.96	160	1.00	7.18	1054	0.05	0.46	0.69	31.62	1214	16.7	16.7	10.0	89	0.0124	
P1- 99	1.5301	0.0024	7,000 +/- resudebtuak kits	76	84	89	91	89	99	0.78	1.53	150	1.00	6.95	304	0.02	0.28	0.43	17.85	454	12.5	12.5	7.5	89	0.0024	
P1- 100	2.9614	0.0046	7,000 +/- resudebtuak kits	76	84	89	91	89	100	0.78	2.96	120	1.00	6.22	550	0.01	0.21	0.32	41.76	670	13.7	13.7	8.2	89	0.0046	

			SCS Curve Numbers																						
			Curve Numbers							Sub-Basin Data			Initial/Overland Time (Ti)			Travel Time (Tt)					Tc Check (Urbanized Basins)		Final Tc	TLAG	HEC-INPUT		Remarks
Drainage Basin Name	Drainage Area (Acres)	Drainage Area (Sq. Mi.)	Cover Type and Hydrologic Condition	Curve # for Hydrologic Soils Group A	B	C	D	Composite CN	Designation (1)	K (Default by CN) (2)	Area (Acres) (3)	Length (feet) (4)	Slope (%) (5)	Ti (Min) (6)	Length (feet) (7)	Slope (%) (8)	V1 (FPS) (Manning) (9)	V2 (FPS) (Manning) (10)	Tt (Min) (11)	Total Length (feet) (12)	Tc= (L/180)+10 (Min) (13)	Tc = Ti+Tt (Min) (14)	(Tc*0.6) (Min)	Composite CN	Drainage Area (Sq. Mi.)	Tc>=10 for Non Urban Tc>=5 for Urban
P1- 101	4.2020	0.0066	7,000 +/- resudebtuak kits	76	84	89	91	89	101	0.78	4.20	130	1.00	6.47	918	0.01	0.18	0.27	71.41	1049	15.8	15.8	9.5	89	0.0066	
P1- 102	2.01	0.0031	7,000 +/- resudebtuak kits	76	84	89	91	89	102	0.78	2.01	140	1.00	6.71	356	0.01	0.23	0.35	25.84	496	12.8	12.8	7.7	89	0.0031	
P1- 103	2.07	0.0032	7,000 +/- resudebtuak kits	76	84	89	91	89	103	0.78	2.07	140	1.00	6.71	412	0.01	0.22	0.34	30.86	552	13.1	13.1	7.8	89	0.0032	
P1- 105	4.67	0.0073	7,000 +/- resudebtuak kits	76	84	89	91	89	105	0.78	4.67	130	1.00	6.47	863	0.01	0.17	0.26	72.59	993	15.5	15.5	9.3	89	0.0073	
		0.2953							0																0.2953	

K = 0.0132*Cn-0.39 Ti = 1.8*(1.1-K)*L^(1/2)/(S^(1/3)) Generalized Manning's Equations

Existing Conditions: V1 = 14.8*(S/100)^0.5 V2 = 29.4*(S/100)^0.5

Developed Conditions: V1 = 20.2*(S/100)^0.5 V2 = 30.6*(S/100)^0.5

Notes:

	A	B	C	D
Open space - poor	68	79	86	89
Open space - fair	49	69	79	84
Open space/parks - good	39	61	74	80
Paved (excludes right-of-way)	98	98	98	98
Paved: curbs and storm drains	98	98	98	98
Paved: open ditches (includes R/W)	83	89	92	93
Gravel (includes R/W)	76	85	89	91
Dirt: (includes R/W)	72	82	87	89
Commercial & Business	89	92	94	95
Industrial	81	88	91	93
Apartments/Condos	81	88	91	93
Townhouses/<= 6000 sq. ft.	80	87	90	92
7000 sq. ft. lots	76	84	89	91
8000 sq. ft. lots	73	82	86	90
10,000 sq. ft. lots	61	75	83	87
14,000 sq. ft. lots	57	72	81	86
20,000 sq. ft. lots	54	70	80	85
40,000 sq. ft. lots	51	68	79	84
80,000 sq. ft. lots	46	65	77	82

Shed Parameters - Pod 1

DEVELOPED CONDITIONS					
Drainage Shed	Area (ac)	Elev dn	Elev up	Length (ft)	Slope
P1- 67	6.82056208	2528.9	2522.9	887	0.6764%
P1- 68	5.43982051	2525.4	2516.7	1232	0.7062%
P1- 69	1.33282528	2525.3	2520.4	468	1.0470%
P1- 70	7.47393562	2525.4	2513.3	1240	0.9758%
P1- 71	2.78410071	2520.9	2517.4	318	1.1006%
P1- 72	2.82990899	2503.1	2497.6	817	0.6732%
P1- 73	1.94640098	2497.6	2492.4	569	0.9139%
P1- 74	6.72332983	2498.9	2488.7	1038	0.9827%
P1- 75	4.28184465	2517.4	2489.2	2240	1.2589%
P1- 76	5.70996719	2502.2	2497.3	925	0.5297%
P1- 77	5.54738366	2499.8	2493.2	602	1.0963%
P1- 78	5.57736688	2509.5	2503.9	941	0.5951%
P1- 79	6.42571205	2512.2	2503.9	990	0.8384%
P1- 80	10.5553556	2530.2	2520.8	1144	0.8217%
P1- 81	1.17969603	2518.9	2515	286	1.3636%
P1- 82	5.12524784	2518.9	2506.1	952	1.3445%
P1- 83	11.151259	2519.5	2510.4	1186	0.7673%
P1- 84	7.38699887	2524.7	2517.8	821	0.8404%
P1- 85	4.23359978	2518.1	2510.9	726	0.9917%
P1- 86	9.13315676	2524.1	2507.5	1474	1.1262%
P1- 87	5.24655358	2519.5	2505.4	1294	1.0896%
P1- 88	8.75517188	2512.4	2502.4	1147	0.8718%
P1- 89	8.803328	2518.7	2496.9	2026	1.0760%
P1- 90	2.41032003	2502.3	2499.3	290	1.0345%
P1- 91	1.08501801	2514.2	2510	231	1.8182%
P1- 92	2.80949645	2508.4	2505.3	436	0.7110%
P1- 93	2.64865483	2502.7	2500.5	400	0.5500%
P1- 94	2.81184315	2503.1	2497.3	1054	0.5503%
P1- 95	2.72709787	2506.4	2503.1	430	0.7674%
P1- 96	11.4479667	2508.2	2489.6	1459	1.2748%
P1- 97	3.21621621	2508.9	2497.6	1103	1.0245%
P1- 98	7.95973724	2551.1	2497.3	1054	5.1044%
P1- 99	1.53009463	2513.9	2507.9	304	1.9737%
P1- 100	2.96143496	2494.8	2488.7	550	1.1091%
P1- 101	4.20201393	2498.1	2490.7	919	0.8052%
P1- 102	2.01486774	2495.7	2491.1	356	1.2921%
P1- 103	2.06835346	2495.6	2490.6	412	1.2136%
P1- 105	4.66530826	2519.1	2513	863	0.7068%

Routing

Kinematic Routing

Reach	Length (ft)	slope	Manning "n"	Sub reaches	Shape	Width	Side Slope (xH:V)
R-C-11	250	0.007	0.016	5	Trapezoid	60	0.5
R-JC1	530	0.01	0.016	5	Trapezoid	20	0.5
R-JC10	50	0.01	0.016	5	Trapezoid	20	0.5
R-JC12	170	0.007	0.016	5	Trapezoid	60	0.5
R-JC13	150	0.007	0.016	5	Trapezoid	60	0.5
R-JC15	820	0.007	0.016	5	Trapezoid	60	0.5
R-JC16	330	0.007	0.016	5	Trapezoid	60	0.5
R-JC19	830	0.007	0.016	5	Trapezoid	60	0.5
R-JC2	50	0.01	0.016	5	Trapezoid	20	0.5
R-JC20	680	0.0109	0.016	5	Trapezoid	60	0.5
R-JC22	1000	0.01	0.025	5	Trapezoid	100	0
R-JC23	550	0.008	0.016	5	Trapezoid	60	0.5
R-JC24	390	0.009	0.016	5	Trapezoid	60	0.5
R-JC27	1130	0.007	0.016	5	Trapezoid	60	0.5
R-JC9	200	0.01	0.023	5	Trapezoid	20	0.5
RP1101	400	0.007	0.016	5	Trapezoid	60	0.5
RP1102	380	0.007	0.016	5	Trapezoid	60	0.5
R-P167	650	0.005	0.016	5	Trapezoid	60	0.5
R-P169	330	0.01	0.025	5	Trapezoid	50	0.5
R-P170	50	0.01	0.016	5	Trapezoid	20	0.5
R-P179	200	0.007	0.016	5	Trapezoid	60	0.5
R-P180	1140	0.007	0.016	5	Trapezoid	60	0.5
R-P181	730	0.007	0.016	5	Trapezoid	60	0.5
R-P192	250	0.007	0.016	5	Trapezoid	60	0.5

Modified Puls Routing

Reach	Paired Data Table*
R-JC3	R-JC3
R-JC4	R-JC4
R-JC5	R-JC5
R-JC6	R-JC6
R-JC7	R-JC7
R-JC8	R-JC8

* See OpenSpace_upper-Mod Puls worksheet for data

OpenSpace_upper-Mod Puls

Flow (cfs)	F-JC8 sta450-0 Storage (ac-ft)	Flow (cfs)	R-J7 sta250-0 Storage (ac-ft)	R-J6 sta600-250 Storage (ac-ft)	R-J5 sta900-600 Storage (ac-ft)	R-J4 sta1200-900 Storage (ac-ft)	R-J3 1350-1200 Storage (ac-ft)
25	0.0851	25	0.0360	0.0547	0.0509	0.0008	0.0259
50	0.1633	50	0.0603	0.0897	0.0867	0.0014	0.0437
75	0.2662	75	0.0817	0.1219	0.1177	0.0019	0.0592
100	0.4082	100	0.1013	0.1520	0.1422	0.0025	0.0733
125	0.5713	125	0.1199	0.1804	0.1721	0.0030	0.0861
150	0.7372	150	0.1378	0.2073	0.1958	0.0034	0.0978
200	1.1608	175	0.1546	0.2336	0.2182	0.0039	0.1088
250	1.6430	200	0.1712	0.2704	0.2402	0.0043	0.1195
300	2.2029	250	0.2020	0.3228	0.2825	0.0051	0.1392

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Arizona 35.14 N 114.18 W 2703 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 3
G.M. Bonnin, D. Todd, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2003

Extracted: Tue Mar 14 2006

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Help | D

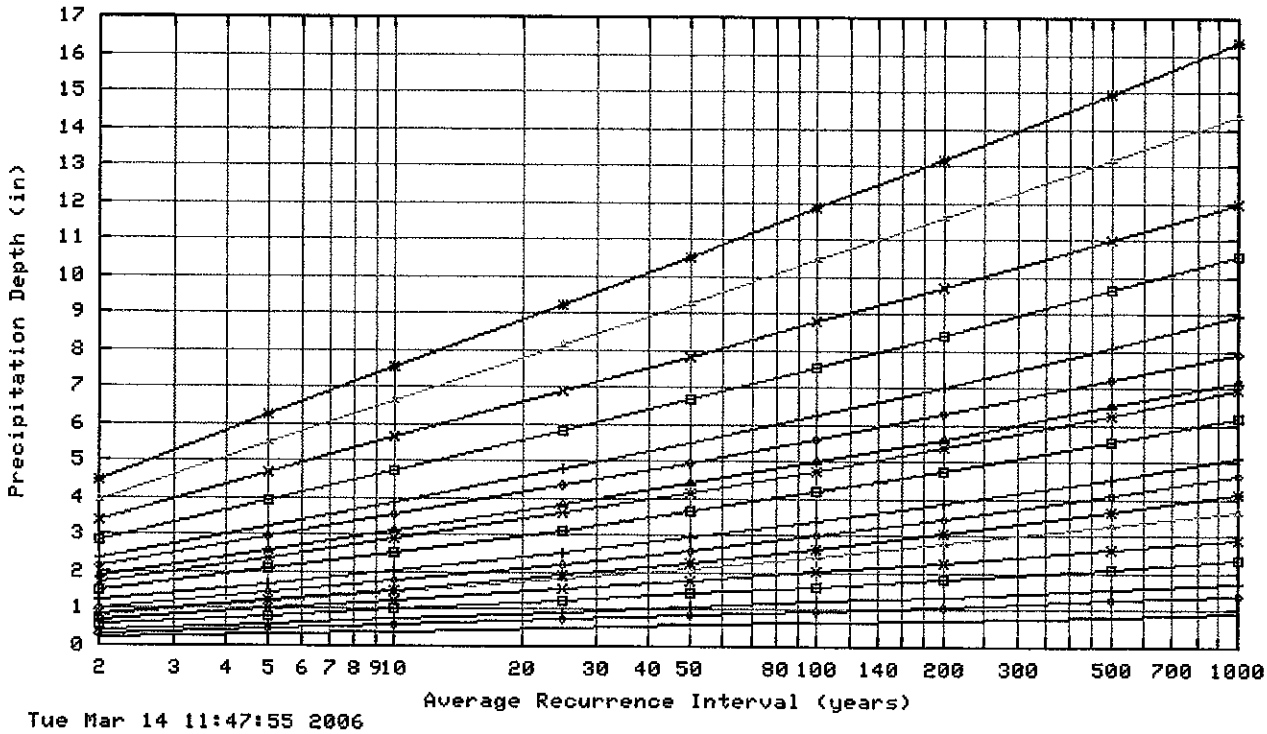
Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.23	0.35	0.43	0.58	0.72	0.82	0.89	1.04	1.22	1.51	1.75	1.91	2.18	2.36	2.87	3.40	3.95	4.46
5	0.33	0.50	0.62	0.83	1.03	1.17	1.25	1.44	1.68	2.08	2.40	2.60	2.96	3.23	3.96	4.69	5.51	6.24
10	0.40	0.61	0.75	1.01	1.25	1.44	1.53	1.76	2.05	2.53	2.90	3.13	3.55	3.90	4.77	5.64	6.64	7.53
25	0.49	0.75	0.93	1.26	1.55	1.82	1.95	2.22	2.56	3.15	3.61	3.85	4.36	4.81	5.85	6.89	8.14	9.25
50	0.57	0.86	1.07	1.44	1.78	2.12	2.29	2.59	2.97	3.66	4.17	4.42	4.98	5.53	6.70	7.83	9.29	10.54
100	0.65	0.98	1.22	1.64	2.03	2.44	2.67	3.00	3.42	4.19	4.76	5.01	5.62	6.26	7.56	8.78	10.45	11.86
200	0.73	1.10	1.37	1.84	2.28	2.79	3.07	3.44	3.88	4.75	5.39	5.64	6.29	7.03	8.44	9.73	11.62	13.19
500	0.84	1.27	1.58	2.12	2.63	3.27	3.67	4.08	4.55	5.55	6.26	6.50	7.21	8.12	9.64	10.99	13.18	14.96
1000	0.93	1.41	1.75	2.36	2.92	3.68	4.17	4.62	5.10	6.20	6.97	7.19	7.95	8.98	10.56	11.95	14.37	16.33

Text version of table

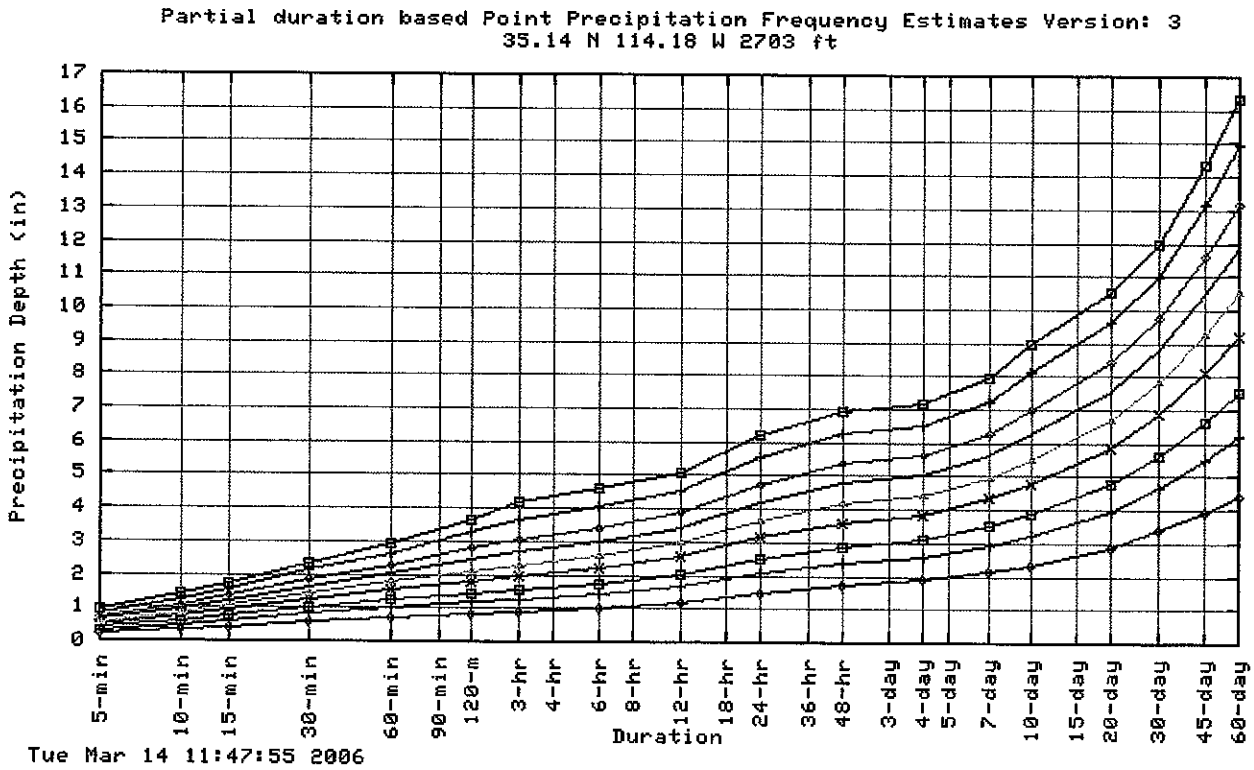
* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.

Partial duration based Point Precipitation Frequency Estimates Version: 3
35.14 N 114.18 W 2703 ft



Tue Mar 14 11:47:55 2006

Duration			
5-min	120-min	48-hr	30-day
10-min	3-hr	4-day	45-day
15-min	6-hr	7-day	60-day
30-min	12-hr	10-day	
60-min	24-hr	20-day	



Confidence Limits -

*** Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)**

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.27	0.42	0.52	0.70	0.86	1.00	1.06	1.23	1.40	1.72	1.97	2.15	2.46	2.65	3.22	3.83	4.49	5.12
5	0.39	0.60	0.74	0.99	1.23	1.42	1.48	1.69	1.93	2.36	2.70	2.92	3.33	3.62	4.43	5.29	6.26	7.16
10	0.48	0.73	0.90	1.21	1.50	1.75	1.83	2.07	2.35	2.86	3.27	3.52	4.00	4.37	5.34	6.35	7.56	8.65
25	0.59	0.90	1.11	1.50	1.85	2.20	2.31	2.60	2.94	3.57	4.07	4.33	4.90	5.40	6.57	7.75	9.28	10.64
50	0.68	1.03	1.28	1.72	2.13	2.58	2.72	3.05	3.43	4.15	4.72	4.98	5.61	6.21	7.53	8.84	10.61	12.13
100	0.77	1.18	1.46	1.96	2.43	2.98	3.18	3.57	3.98	4.79	5.41	5.68	6.36	7.08	8.54	9.96	11.97	13.71
200	0.87	1.33	1.65	2.22	2.75	3.42	3.73	4.13	4.58	5.46	6.15	6.43	7.17	8.01	9.57	11.09	13.36	15.33
500	1.02	1.56	1.93	2.60	3.22	4.09	4.53	4.99	5.52	6.46	7.22	7.49	8.30	9.33	10.99	12.61	15.24	17.51
1000	1.15	1.75	2.17	2.93	3.62	4.67	5.22	5.73	6.32	7.30	8.10	8.35	9.21	10.40	12.13	13.82	16.75	19.23

* The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than.
** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

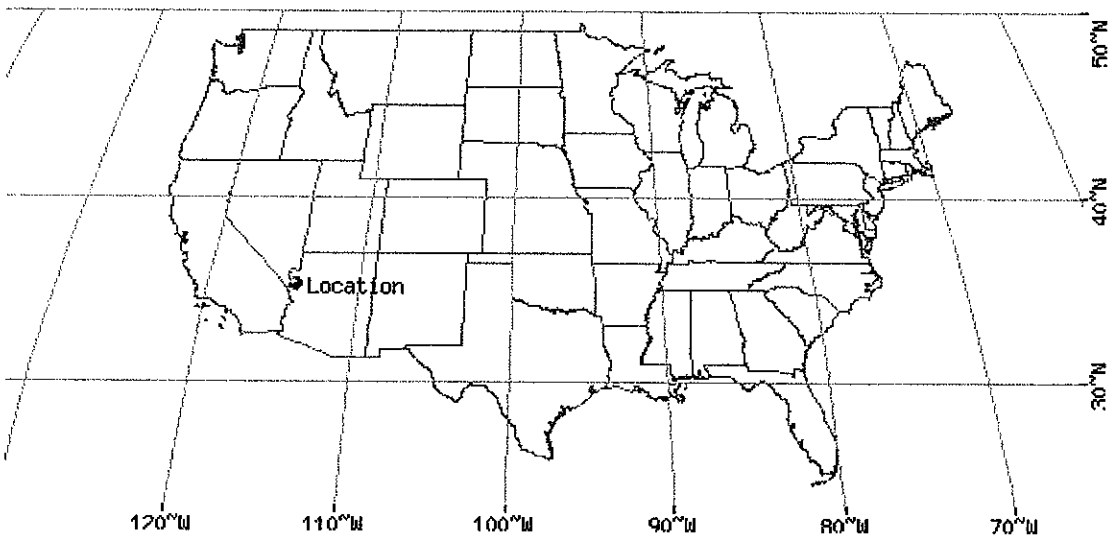
*** Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)**

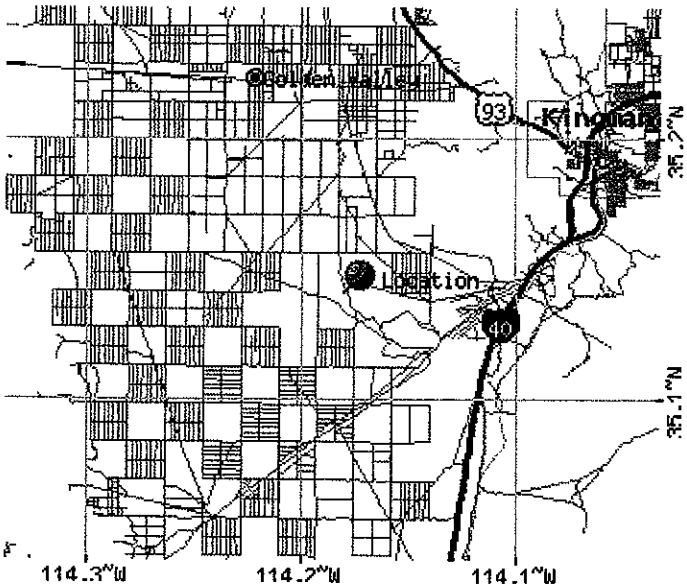
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.19	0.29	0.36	0.49	0.60	0.69	0.76	0.91	1.06	1.34	1.55	1.71	1.95	2.10	2.56	3.01	3.45	3.87
5	0.28	0.42	0.52	0.70	0.87	0.98	1.06	1.25	1.45	1.84	2.12	2.31	2.64	2.87	3.52	4.15	4.80	5.40
10	0.33	0.51	0.63	0.85	1.05	1.19	1.29	1.51	1.77	2.23	2.56	2.79	3.16	3.46	4.22	4.98	5.78	6.50
25	0.41	0.62	0.78	1.04	1.29	1.47	1.60	1.86	2.16	2.74	3.16	3.40	3.85	4.25	5.14	6.07	7.05	7.96
50	0.46	0.70	0.87	1.18	1.46	1.70	1.86	2.13	2.46	3.14	3.62	3.88	4.37	4.85	5.86	6.85	7.99	9.02
100	0.52	0.79	0.98	1.32	1.63	1.92	2.12	2.41	2.77	3.55	4.10	4.37	4.91	5.46	6.58	7.64	8.92	10.07
200	0.57	0.87	1.08	1.46	1.80	2.14	2.37	2.70	3.08	3.96	4.58	4.86	5.43	6.07	7.29	8.41	9.86	11.13
500	0.65	0.98	1.22	1.64	2.03	2.46	2.74	3.08	3.48	4.52	5.25	5.52	6.14	6.91	8.23	9.40	11.06	12.46
1000	0.70	1.06	1.32	1.78	2.20	2.68	3.03	3.38	3.80	4.94	5.76	6.03	6.69	7.57	8.92	10.12	11.96	13.46

* The lower bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.
** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.

Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Maps -





These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server.

Please read disclaimer for more information.

LEGEND

State
County
Indian Resv
Lake/Pond/Ocean
Street
Expressway
Highway
Connector
Stream
Military Area
National Park
Other Park
City
County

Scale 1:228583
0 2 4 6 8 10 km
0 2 4 6 8 mi
*average--true scale depends on monitor resolution

Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available
from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the National Digital Orthophoto Program (NDOP) for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information
about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study,
please refer to our documentation.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

+/-30 minutes ...OR... +/-1 degree of this location (35.14/-114.18). Digital ASCII data can be obtained directly from **NCDC**.

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the **Western Regional Climate Center's state-specific SNOTEL station maps**.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

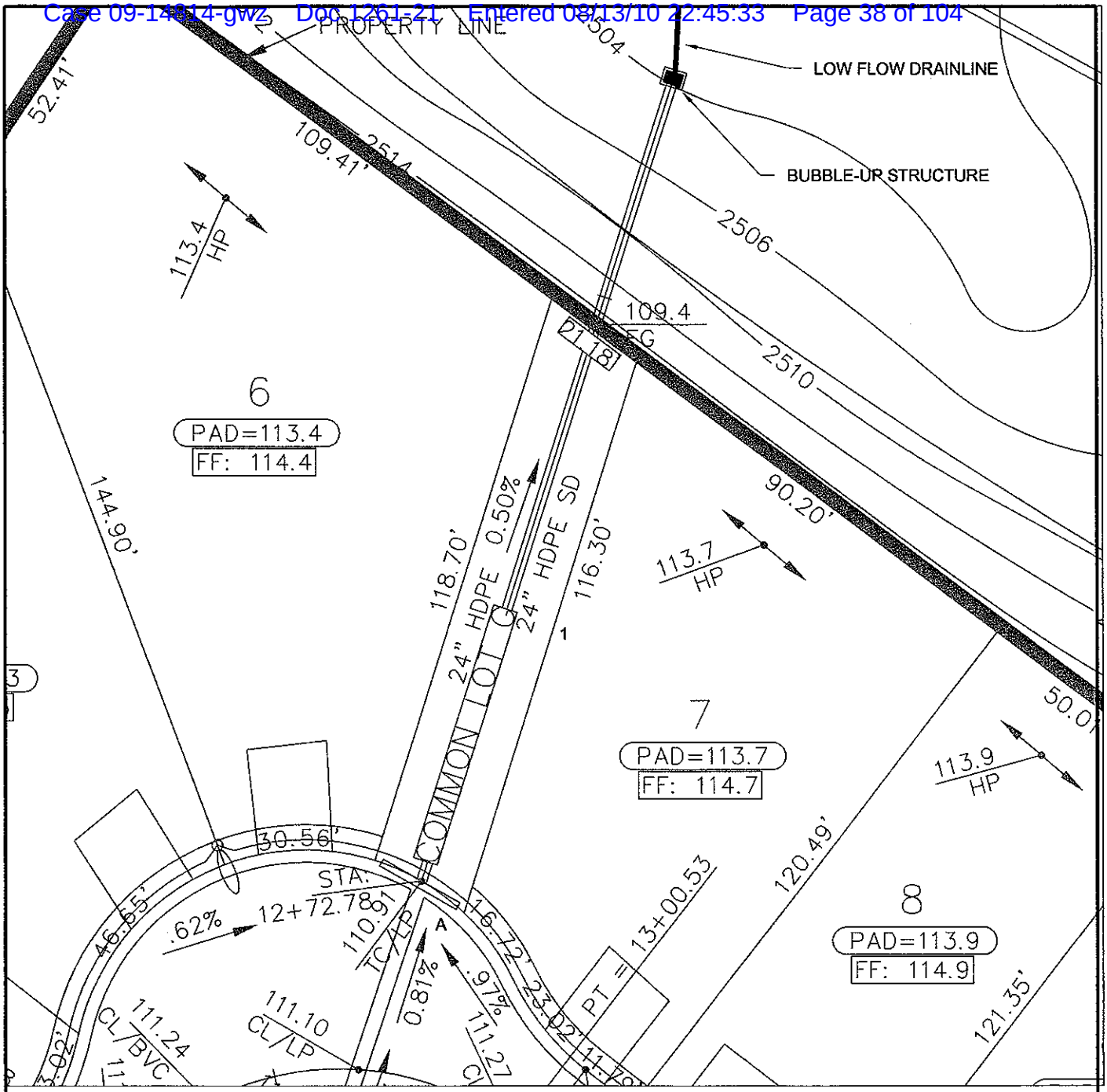
(301) 713-1669
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX B

DRAINAGE INFRASTRUCTURE CALCULATIONS

- COMMON LOT O (P1-83)
- COMMON LOT F (J-C14)
- COMMON LOT E (J-C17)
- H STREET (J-C21)
- COMMON LOT D (J-C25)



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	17.5	39	15	24	S

SD PIPES		
PIPE	Qpipe	Size
1	15	24

BUBBLE-UP STR		
PIPE	Type	Open Area
24	Type F	2.5 x 3.5

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 – PHASE A

COMMON LOT O
SHED P1-83

SCALE 1" = 30'

NO.	REV.
A	0

$$$$FILENAME$$$$ CADD A1-R3 © STANLEY CONSULTANTS

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-17.5
SHEET P1-83 INLET A Common Lot. "G"
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

		Composite/Dep
	Cross Slope	
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

		Curb-Opening
	Inlet Type *Sag*	
L	Curb-Opening Length (ft)	8.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.00
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	7.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.521
d_curb	Depth at Curb (ft)	0.667
Qi	Intercepted Flow (cfs)	15.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT G - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	24.00	cfs

Results		
Depth	0.60	ft
Flow Area	10.2	ft²
Wetted Perimeter	34.36	ft
Top Width	34.34	ft
Critical Depth	0.53	ft
Critical Slope	0.009063	ft/ft
Velocity	2.34	ft/s
Velocity Head	0.09	ft
Specific Energy	0.68	ft
Froude Number	0.76	
Flow Type	Subcritical	

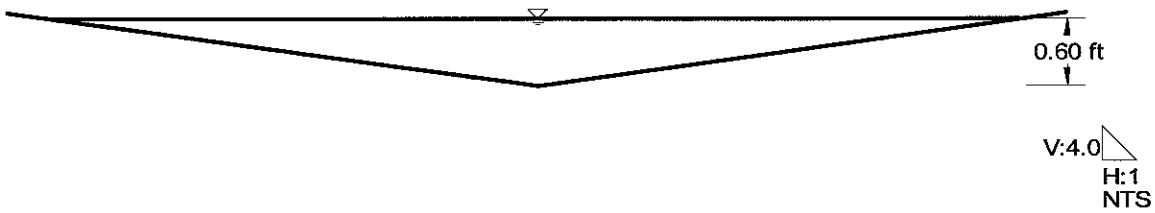
VELOCITY x DEPTH.

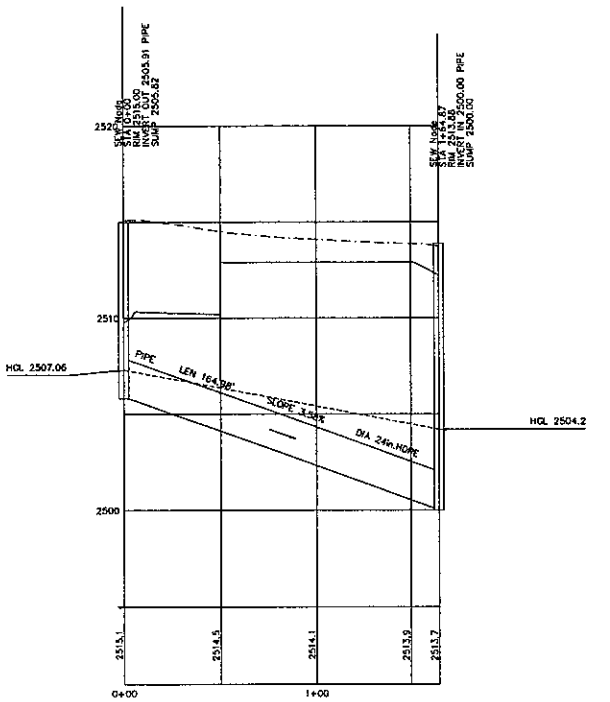
2.3 x 0.6 = 1.4 < 6.0

Cross Section
Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT G - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.60	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	24.00	cfs





REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 – PHASE A

COMMON LOT O
SHED P1-83

SCALE

NO.	REV.
A	0

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

EASEMENT DETAIL J STREET TO GOLF COURSE - 15CFS - P183

DATE: 3/14/2006
TIME: 13:45

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	24	4			2.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT		W S ELEV
	100.00	2500.00	24		2504.20

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	265.00	2505.91	24	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	265.00	2505.91	24	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
EASEMENT DETAIL Y J STREET TO GOLF COURSE

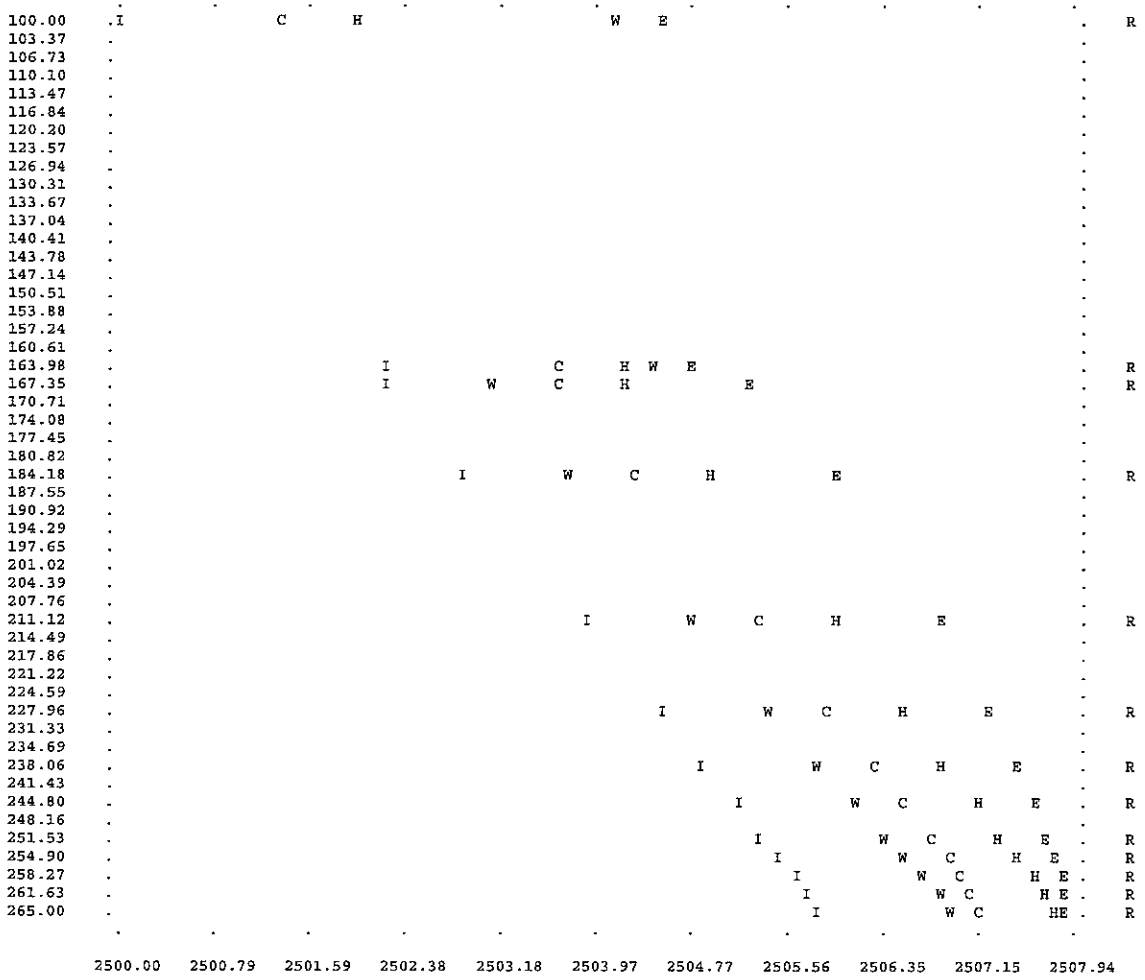
STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2500.00	4.200	2504.200	15.0	4.77	0.354	2504.554	0.00	1.396		2.00	0.00	0.00	0	0.00
63.12	0.03582					.004396	0.28			0.820			0.00		
163.12	2502.26	2.220	2504.481	15.0	4.77	0.354	2504.835	0.00	1.396		2.00	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
163.12	2502.26	0.843	2503.104	15.0	11.92	2.208	2505.312	0.00	1.396		2.00	0.00	0.00	0	0.00
18.65	0.03582					.031962	0.60			0.820			0.00		
181.77	2502.93	0.843	2503.772	15.0	11.91	2.204	2505.976	0.00	1.396		2.00	0.00	0.00	0	0.00
28.97	0.03582					.029974	0.87			0.820			0.00		
210.74	2503.97	0.874	2504.840	15.0	11.36	2.002	2506.842	0.00	1.396		2.00	0.00	0.00	0	0.00
15.73	0.03582					.026343	0.41			0.820			0.00		
226.47	2504.53	0.907	2505.437	15.0	10.83	1.821	2507.258	0.00	1.396		2.00	0.00	0.00	0	0.00
10.47	0.03582					.023157	0.24			0.820			0.00		
236.94	2504.91	0.940	2505.845	15.0	10.32	1.655	2507.500	0.00	1.396		2.00	0.00	0.00	0	0.00
7.41	0.03582					.020366	0.15			0.820			0.00		
244.35	2505.17	0.976	2506.146	15.0	9.84	1.504	2507.650	0.00	1.396		2.00	0.00	0.00	0	0.00
5.58	0.03582					.017930	0.10			0.820			0.00		
249.93	2505.37	1.013	2506.383	15.0	9.39	1.368	2507.751	0.00	1.396		2.00	0.00	0.00	0	0.00
4.26	0.03582					.015793	0.07			0.820			0.00		
254.19	2505.52	1.052	2506.575	15.0	8.95	1.244	2507.819	0.00	1.396		2.00	0.00	0.00	0	0.00
3.29	0.03582					.013924	0.05			0.820			0.00		
257.48	2505.64	1.093	2506.734	15.0	8.53	1.130	2507.864	0.00	1.396		2.00	0.00	0.00	0	0.00
2.54	0.03582					.012286	0.03			0.820			0.00		

WATER SURFACE PROFILE LISTING

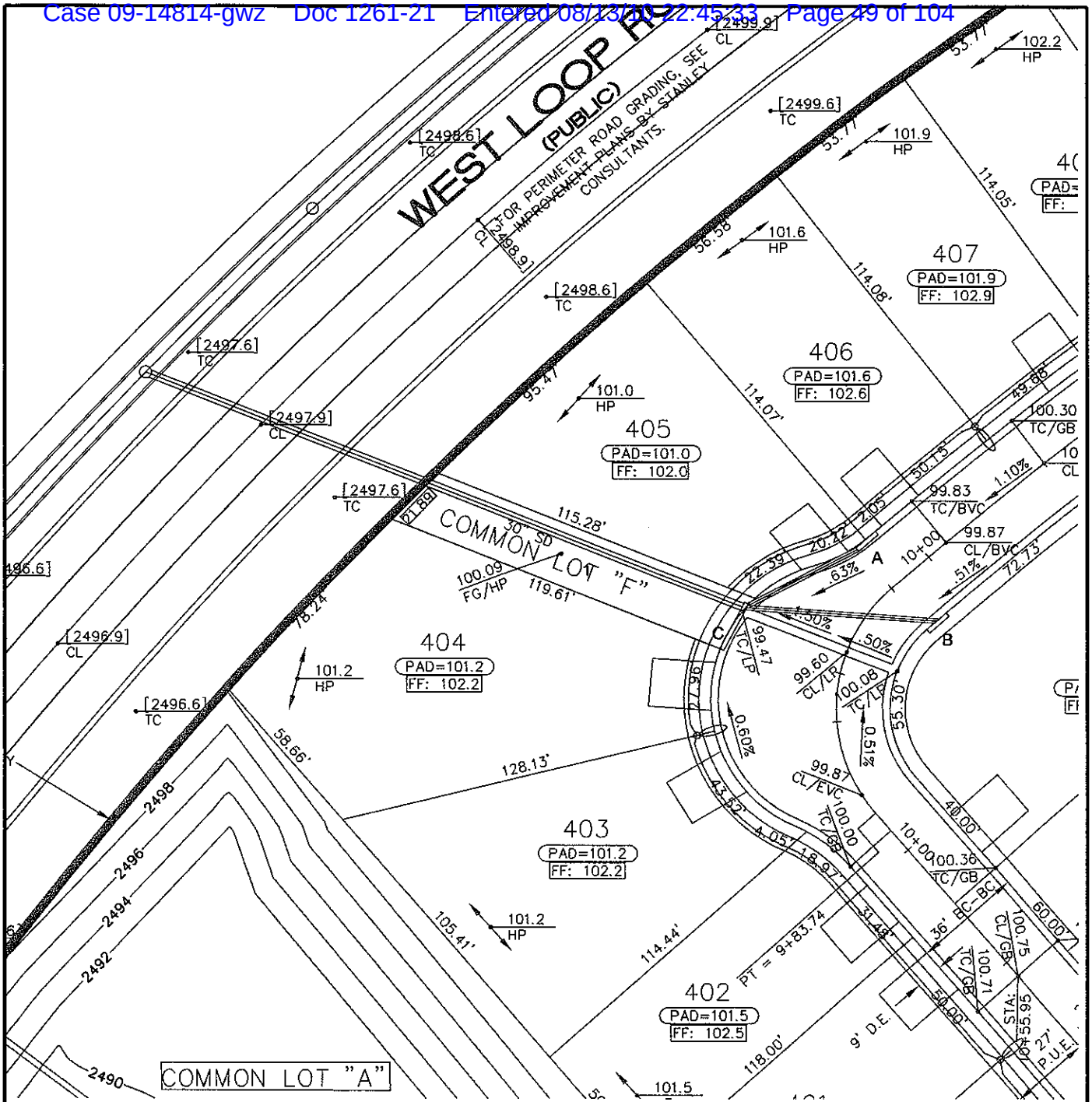
GOLDEN VALLEY RANCH
GOLDEN VALLEY
EASEMENT DETAIL Y J STREET TO GOLF COURSE

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
260.02	2505.73	1.136	2506.868	15.0	8.13	1.027	2507.895	0.00	1.396		2.00	0.00	0.00	0	0.00
1.90	0.03582					.010856	0.02			0.820			0.00		
261.92	2505.80	1.182	2506.982	15.0	7.76	0.934	2507.916	0.00	1.396		2.00	0.00	0.00	0	0.00
1.41	0.03582					.009604	0.01			0.820			0.00		
263.33	2505.85	1.230	2507.080	15.0	7.40	0.849	2507.929	0.00	1.396		2.00	0.00	0.00	0	0.00
0.96	0.03582					.008507	0.01			0.820			0.00		
264.29	2505.89	1.281	2507.166	15.0	7.05	0.772	2507.938	0.00	1.396		2.00	0.00	0.00	0	0.00
0.54	0.03582					.007550	0.00			0.820			0.00		
264.83	2505.90	1.336	2507.240	15.0	6.72	0.702	2507.942	0.00	1.396		2.00	0.00	0.00	0	0.00
0.17	0.03582					.006712	0.00			0.820			0.00		
265.00	2505.91	1.396	2507.306	15.0	6.40	0.637	2507.943	0.00	1.396		2.00	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
EASEMENT DETAIL Y J STREET TO GOLF COURSE



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	8.5	19	7	9	G
B	11.5	20	10	10	G
C	11.5	28	11	17	S

SD PIPES		
PIPE	Qpipe	Size
1	19	30

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHOHES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 – PHASE A

COMMON LOT F
NODE J-C14

SCALE 1" = 40'

NO.	REV.
A	0

FILENAME
CADD A1-R3

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT F
NODE J-C14
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

		Composite
	Cross Slope	
S	Longitudinal Slope (ft/ft)	0.0063
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	19.000
T	Width of Spread (ft)	23.45

Gutter Flow

Eo	Gutter Flow Ratio	0.186
d	Depth of Flow (ft)	0.56
V	Average Velocity (ft/sec)	3.41

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	31.70	4.25	0.08	1.453	17.547
Parallel Bar P-1-7/8	1.50	2.88	0.31	5.456	12.092
Combination			0.36	6.908	12.092

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476 - Pod 1
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description

LOT F
NODE J-C14
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
S	Cross Slope Longitudinal Slope	(ft/ft)	0.0051
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		20.000
T	Width of Spread (ft)		25.00

Gutter Flow

Eo	Gutter Flow Ratio	0.174
d	Depth of Flow (ft)	0.59
V	Average Velocity (ft/sec)	3.17

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	31.15	5.75	0.08	1.555	18.445
Parallel Bar P-1-7/8	1.50	4.38	0.46	8.482	9.963
Combination			0.50	10.037	9.963

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-11.5
NODE J-C14 INLET C
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope		Composite/Dep
Sx	Pavement Cross Slope	(ft/ft)	0.0100
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00

Inlet Interception

	Inlet Type *Sag*		Curb-Opening
L	Curb-Opening Length	(ft)	5.75
H	Curb-Opening Height	(in)	6.00
	Inlet Type *Sag*		Parallel Bar P-1-7/8
T	Width of Spread	(ft)	39.48
WGR	Grate Width	(ft)	1.50
L	Grate Length	(ft)	4.38
	Inlet Type *Sag*		Sweeper Combination
d_ave	Depth of Flow	(ft)	0.526
d_curb	Depth at Curb	(ft)	0.671
Qi	Intercepted Flow	(cfs)	11.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet
Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT F - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	19.00	cfs

Results		
Depth	0.55	ft
Flow Area	8.6	ft²
Wetted Perimeter	31.49	ft
Top Width	31.47	ft
Critical Depth	0.49	ft
Critical Slope	0.009350	ft/ft
Velocity	2.21	ft/s
Velocity Head	0.08	ft
Specific Energy	0.62	ft
Froude Number	0.75	
Flow Type	Subcritical	

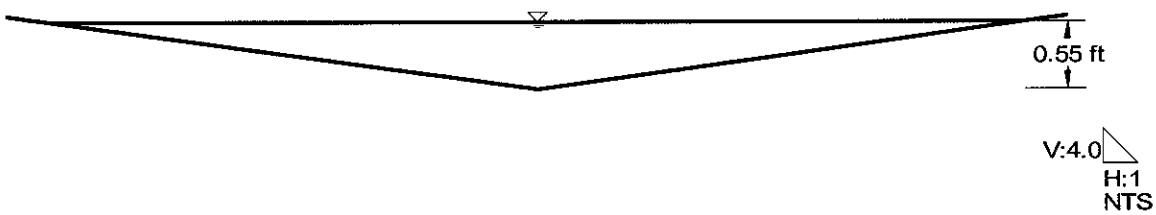
VELOCITY x DEPTH

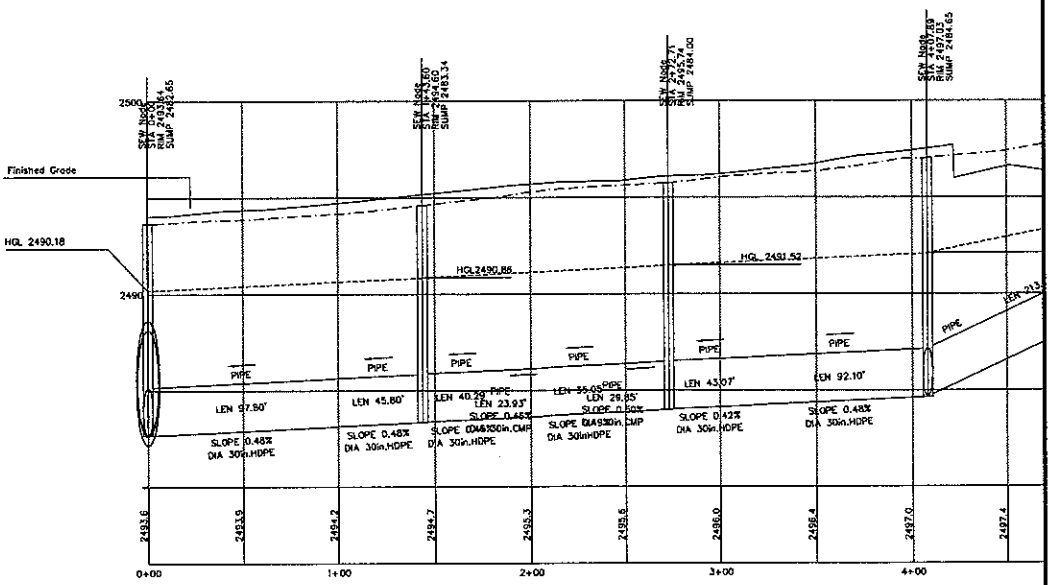
2.2 x 0.6 = 1.3 < 6.0

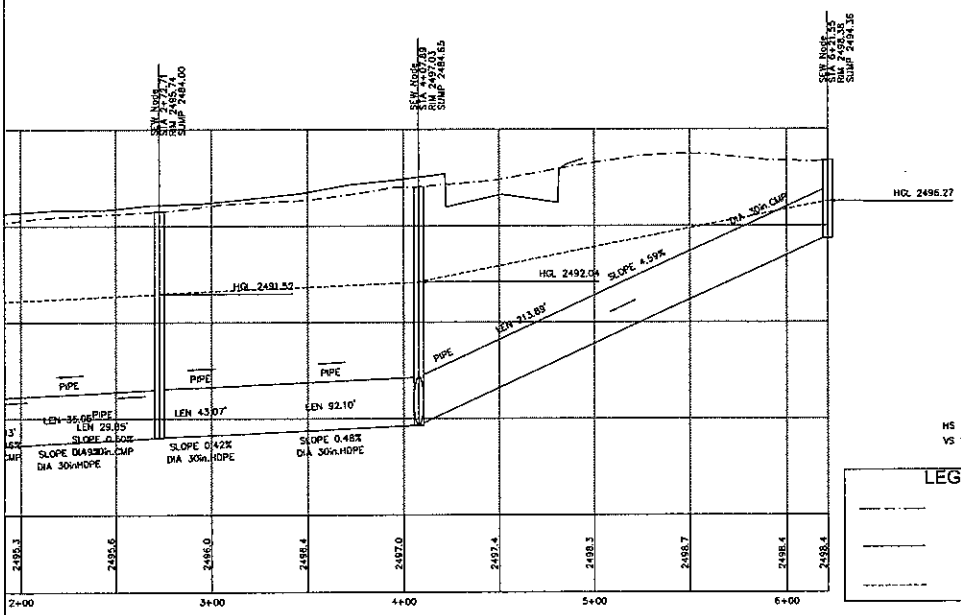
Cross Section
Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT F - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.55	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	19.00	cfs







REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 – PHASE A

COMMON LOT F
NODE J-C14

SCALE

NO.	REV.
A	0

ST-RH036358

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$$$$$$$$$$FILENAME$$$$$$$$$$

CADD A1-R3 © STANLEY CONSULTANTS

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH JC14 - 28 CFS

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH JC14 - 28 CFS AT STA 105 + ON WLPR

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2482.64	30	2490.18

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	240.00	2483.34	30	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	245.00	2483.36	30	0	0	0.014	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	372.00	2484.00	30	0.013	0.00	0.00	5.00	0

ELEMENT NO 5 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	377.00	2484.02	30	0	0	0.014	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	502.00	2484.65	30	0.013	0.00	0.00	5.00	0

ELEMENT NO 7 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	507.00	2484.67	30	0	0	0.014	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 8 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	715.00	2494.47	30	0.013	0.00	0.00	70.00	0

ELEMENT NO 9 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	715.00	2494.47	30	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH JC14 - 28 CFS

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2482.64	7.540	2490.180	28.0	5.70	0.505	2490.685	0.00	1.804		2.50	0.00	0.00	0	0.00
140.00	0.00500					.004660	0.65			1.973			0.00		
240.00	2483.34	7.492	2490.832	28.0	5.70	0.505	2491.337	0.00	1.804		2.50	0.00	0.00	0	0.00
JUNCT STR	0.00400					.005404	0.03						0.00		
245.00	2483.36	7.499	2490.859	28.0	5.70	0.505	2491.364	0.00	1.804		2.50	0.00	0.00	0	0.00
127.00	0.00504					.004660	0.59			1.970			0.00		
372.00	2484.00	7.460	2491.460	28.0	5.70	0.505	2491.965	0.00	1.804		2.50	0.00	0.00	0	0.00
JUNCT STR	0.00400					.005404	0.03						0.00		
377.00	2484.02	7.467	2491.487	28.0	5.70	0.505	2491.992	0.00	1.804		2.50	0.00	0.00	0	0.00
125.00	0.00504					.004660	0.58			1.970			0.00		
502.00	2484.65	7.427	2492.077	28.0	5.70	0.505	2492.582	0.00	1.804		2.50	0.00	0.00	0	0.00
JUNCT STR	0.00400					.005404	0.03						0.00		
507.00	2484.67	7.434	2492.104	28.0	5.70	0.505	2492.609	0.00	1.804		2.50	0.00	0.00	0	0.00
104.95	0.04711					.004660	0.49			0.961			0.00		
611.95	2489.61	3.082	2492.697	28.0	5.70	0.505	2493.202	0.00	1.804		2.50	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
611.95	2489.61	1.008	2490.623	28.0	15.11	3.546	2494.169	0.00	1.804		2.50	0.00	0.00	0	0.00
4.09	0.04711					.039811	0.16			0.961			0.00		
616.04	2489.81	1.008	2490.815	28.0	15.09	3.538	2494.353	0.00	1.804		2.50	0.00	0.00	0	0.00
29.13	0.04711					.037340	1.09			0.961			0.00		
645.17	2491.18	1.045	2492.225	28.0	14.40	3.218	2495.443	0.00	1.804		2.50	0.00	0.00	0	0.00
17.77	0.04711					.032787	0.58			0.961			0.00		

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH JC14 - 28 CFS

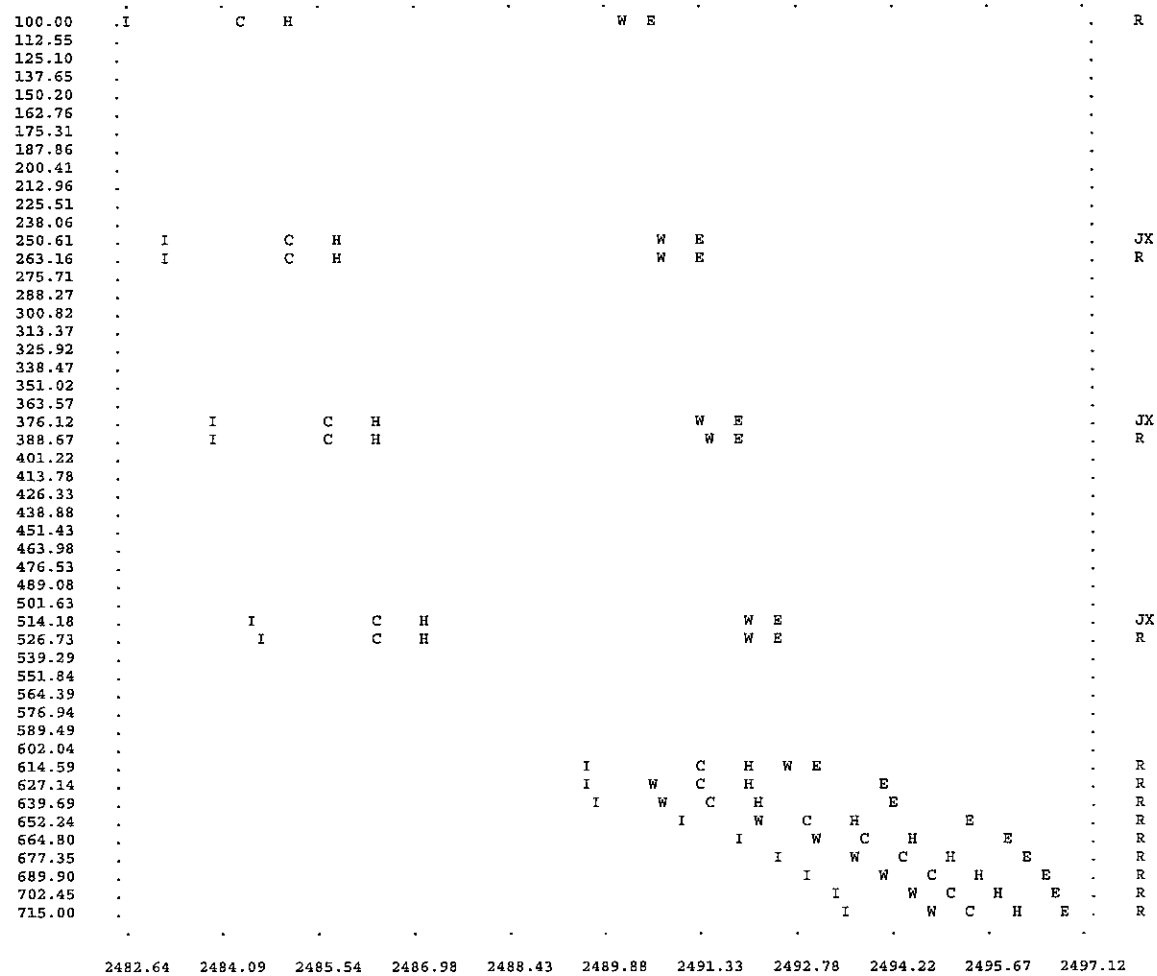
STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
662.94	2492.02	1.083	2493.100	28.0	13.73	2.925	2496.025	0.00	1.804		2.50	0.00	0.00	0	0.00
12.33	0.04711					.028800	0.36			0.961			0.00		
675.27	2492.60	1.123	2493.721	28.0	13.08	2.658	2496.379	0.00	1.804		2.50	0.00	0.00	0	0.00
9.17	0.04711					.025315	0.23			0.961			0.00		
684.44	2493.03	1.165	2494.195	28.0	12.48	2.418	2496.613	0.00	1.804		2.50	0.00	0.00	0	0.00
7.07	0.04711					.022267	0.16			0.961			0.00		
691.51	2493.36	1.209	2494.572	28.0	11.89	2.197	2496.769	0.00	1.804		2.50	0.00	0.00	0	0.00
5.59	0.04711					.019599	0.11			0.961			0.00		
697.10	2493.63	1.255	2494.882	28.0	11.35	1.999	2496.881	0.00	1.804		2.50	0.00	0.00	0	0.00
4.48	0.04711					.017261	0.08			0.961			0.00		
701.58	2493.84	1.303	2495.141	28.0	10.81	1.816	2496.957	0.00	1.804		2.50	0.00	0.00	0	0.00
3.57	0.04711					.015215	0.05			0.961			0.00		
705.15	2494.01	1.354	2495.360	28.0	10.31	1.652	2497.012	0.00	1.804		2.50	0.00	0.00	0	0.00
2.89	0.04711					.013424	0.04			0.961			0.00		
708.04	2494.14	1.407	2495.549	28.0	9.83	1.501	2497.050	0.00	1.804		2.50	0.00	0.00	0	0.00
2.28	0.04711					.011855	0.03			0.961			0.00		
710.32	2494.25	1.463	2495.712	28.0	9.37	1.364	2497.076	0.00	1.804		2.50	0.00	0.00	0	0.00
1.75	0.04711					.010484	0.02			0.961			0.00		
712.07	2494.33	1.523	2495.855	28.0	8.94	1.240	2497.095	0.00	1.804		2.50	0.00	0.00	0	0.00
1.31	0.04711					.009286	0.01			0.961			0.00		
713.38	2494.39	1.586	2495.980	28.0	8.52	1.128	2497.108	0.00	1.804		2.50	0.00	0.00	0	0.00
0.92	0.04711					.008237	0.01			0.961			0.00		

WATER SURFACE PROFILE LISTING

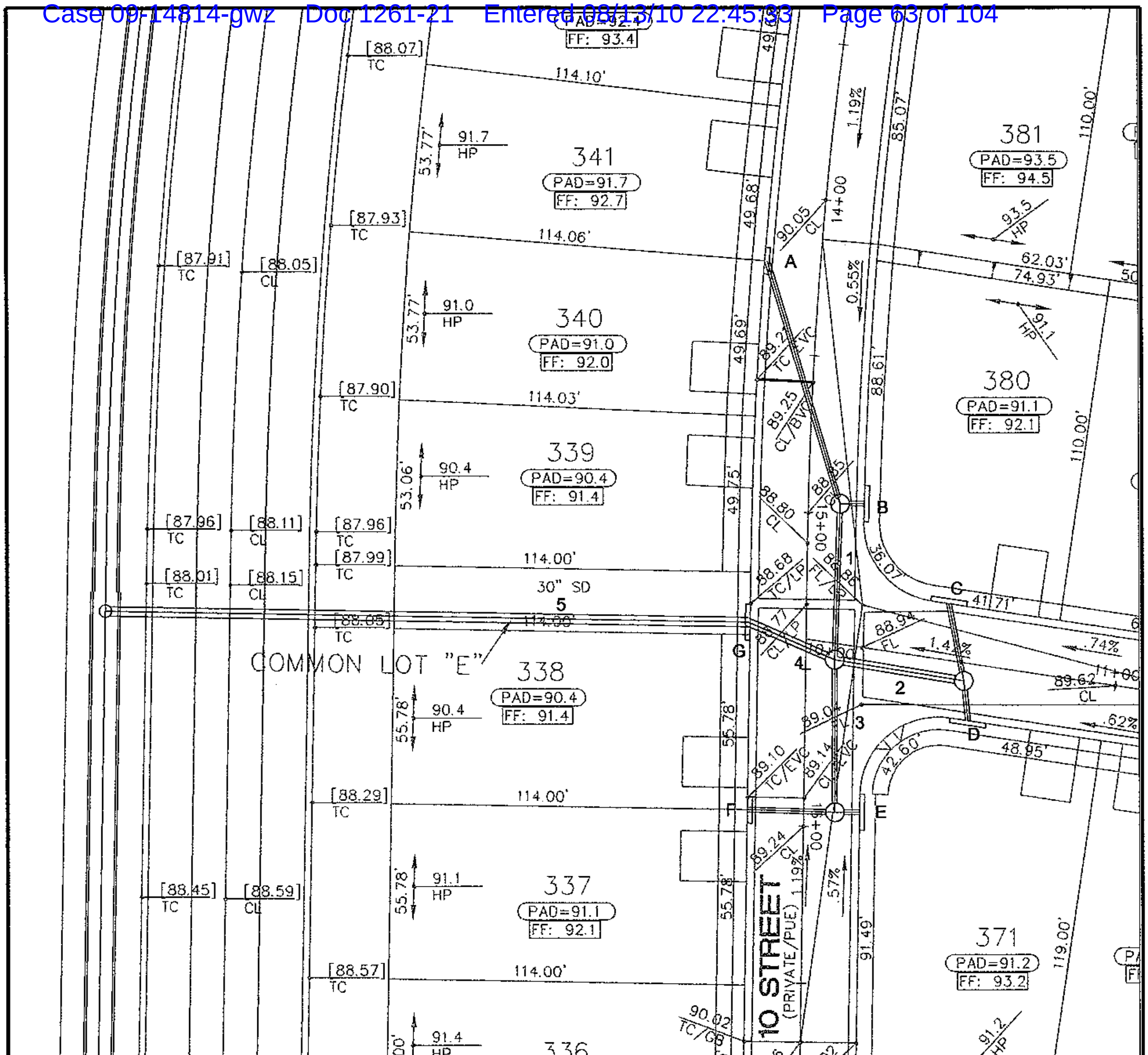
GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH JC14 - 28 CFS

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
714.30	2494.44	1.653	2496.090	28.0	8.13	1.025	2497.115	0.00	1.804		2.50	0.00	0.00	0	0.00
0.53	0.04711					.007323	0.00			0.961			0.00		
714.83	2494.46	1.725	2496.187	28.0	7.75	0.932	2497.119	0.00	1.804		2.50	0.00	0.00	0	0.00
0.17	0.04711					.006524	0.00			0.961			0.00		
715.00	2494.47	1.804	2496.274	28.0	7.38	0.846	2497.120	0.00	1.804		2.50	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH JC14 - 28 CFS



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	8.5	15	6	9	G
B	11.5	16	7	9	G
C	14.5	33	14	19	G
D	8.5	33	14	19	G
E	11.5	12	7	7	G
F	8.5	13	5	6	G
G	11.5	67	11	56	S

SD PIPES		
PIPE	Qpipe	Size
1	13	A
2	28	B
3	12	C
4	53	D
5	64	36

$$$$$$$$$$$$$$$$FILENAME$$$$$$$$$$$$$$$$

CADD A1-R3

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 - PHASE B

COMMON LOT E
NODE J-C17

SCALE 1" = 50'
NO. A
REV. 0

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

		Composite
	Cross Slope	
S	Longitudinal Slope (ft/ft)	0.0119
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	15.000
T	Width of Spread (ft)	18.94

Gutter Flow

Eo	Gutter Flow Ratio	0.233
d	Depth of Flow (ft)	0.47
V	Average Velocity (ft/sec)	4.10

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	31.84	4.25	0.08	1.142	13.858
Parallel Bar P-1-7/8	1.50	2.88	0.32	4.491	9.368
Combination			0.38	5.632	9.368

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

		Composite
	Cross Slope	
S	Longitudinal Slope (ft/ft)	0.0119
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	16.000
T	Width of Spread (ft)	19.42

Gutter Flow

Eo	Gutter Flow Ratio	0.227
d	Depth of Flow (ft)	0.48
V	Average Velocity (ft/sec)	4.16

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	33.06	5.75	0.07	1.174	14.826
Parallel Bar P-1-7/8	1.50	4.38	0.42	6.193	8.634
Combination			0.46	7.366	8.634

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET C

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0050
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		33.000
T	Width of Spread (ft)		30.33

Gutter Flow

Eo	Gutter Flow Ratio	0.142
d	Depth of Flow (ft)	0.70
V	Average Velocity (ft/sec)	3.56

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	41.02	5.75	0.06	1.957	31.043
Parallel Bar P-1-7/8	1.50	4.38	0.40	12.308	18.734
Combination			0.43	14.266	18.734

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET D

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0062
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		33.000
T	Width of Spread (ft)		29.12

Gutter Flow

Eo	Gutter Flow Ratio	0.148
d	Depth of Flow (ft)	0.68
V	Average Velocity (ft/sec)	3.86

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	43.13	5.75	0.06	1.863	31.137
Parallel Bar P-1-7/8	1.50	4.38	0.38	11.702	19.435
Combination			0.41	13.565	19.435

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET E

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

		Composite
	Cross Slope	
S	Longitudinal Slope (ft/ft)	0.0050
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	12.000
T	Width of Spread (ft)	20.55

Gutter Flow

Eo	Gutter Flow Ratio	0.214
d	Depth of Flow (ft)	0.51
V	Average Velocity (ft/sec)	2.79

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	23.12	4.25	0.10	1.249	10.751
Parallel Bar P-1-7/8	1.50	2.88	0.38	4.073	6.678
Combination			0.44	5.322	6.678

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET F

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

		Composite
	Cross Slope	
S	Longitudinal Slope (ft/ft)	0.0057
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	13.000
T	Width of Spread (ft)	20.66

Gutter Flow

Eo	Gutter Flow Ratio	0.212
d	Depth of Flow (ft)	0.51
V	Average Velocity (ft/sec)	2.99

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	24.93	5.75	0.10	1.258	11.742
Parallel Bar P-1-7/8	1.50	4.38	0.51	5.948	5.795
Combination			0.55	7.205	5.795

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-11.5
NODE J-C17 INLET G
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope	Composite/Dep
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	5.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.48
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	4.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.526
d_curb	Depth at Curb (ft)	0.671
Qi	Intercepted Flow (cfs)	11.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT E - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	56.00	cfs

Results		
Depth	0.82	ft
Flow Area	19.3	ft²
Wetted Perimeter	47.22	ft
Top Width	47.19	ft
Critical Depth	0.75	ft
Critical Slope	0.008092	ft/ft
Velocity	2.90	ft/s
Velocity Head	0.13	ft
Specific Energy	0.95	ft
Froude Number	0.80	
Flow Type	Subcritical	

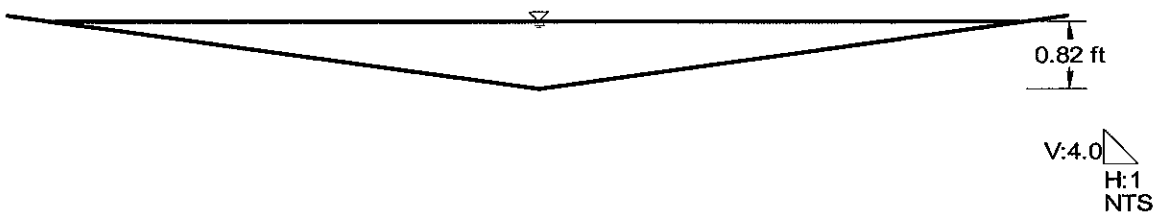
VELOCITY x DEPTH.

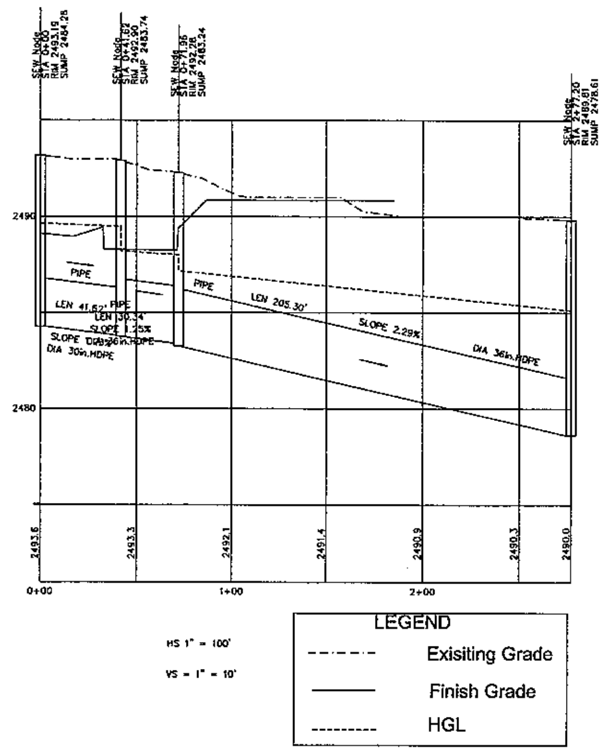
2.9 x 0.8 = 2.3 < 6.0

Cross Section
Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT E - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.82	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	56.00	cfs





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CADD A1-R3 © STANLEY CONSULTANTS

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 - PHASE B

COMMON LOT E
NODE J-C17

SCALE 1:1

NO.	REV.
A	0

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH 28 CFS IN POD 2 - J-C17 STA 93 + ON WLPR

DATE: 3/15/2006
TIME: 13:11

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	48	4			4.00														
CD	18	4			1.50														
CD	36	4			3.00														
CD	30	4			2.50														
CD	24	4			2.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2482.05	36	2485.11

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	302.00	2483.24	36	0.013	0.00	0.00	45.00	0

ELEMENT NO 3 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	307.00	2483.36	36	24	0	0.013	11.0	0.0	2483.36	0.00	90.00	0.00

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	332.00	2483.74	36	0.013	0.00	0.00	10.00	0

ELEMENT NO 5 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	337.00	2483.78	36	18	18	0.013	13.0	12.0	2483.78	2483.78	90.00	90.00

WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	375.00	2484.29	30	0.013	0.00	0.00	0.00	0

ELEMENT NO 7 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	375.00	2484.29	30	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

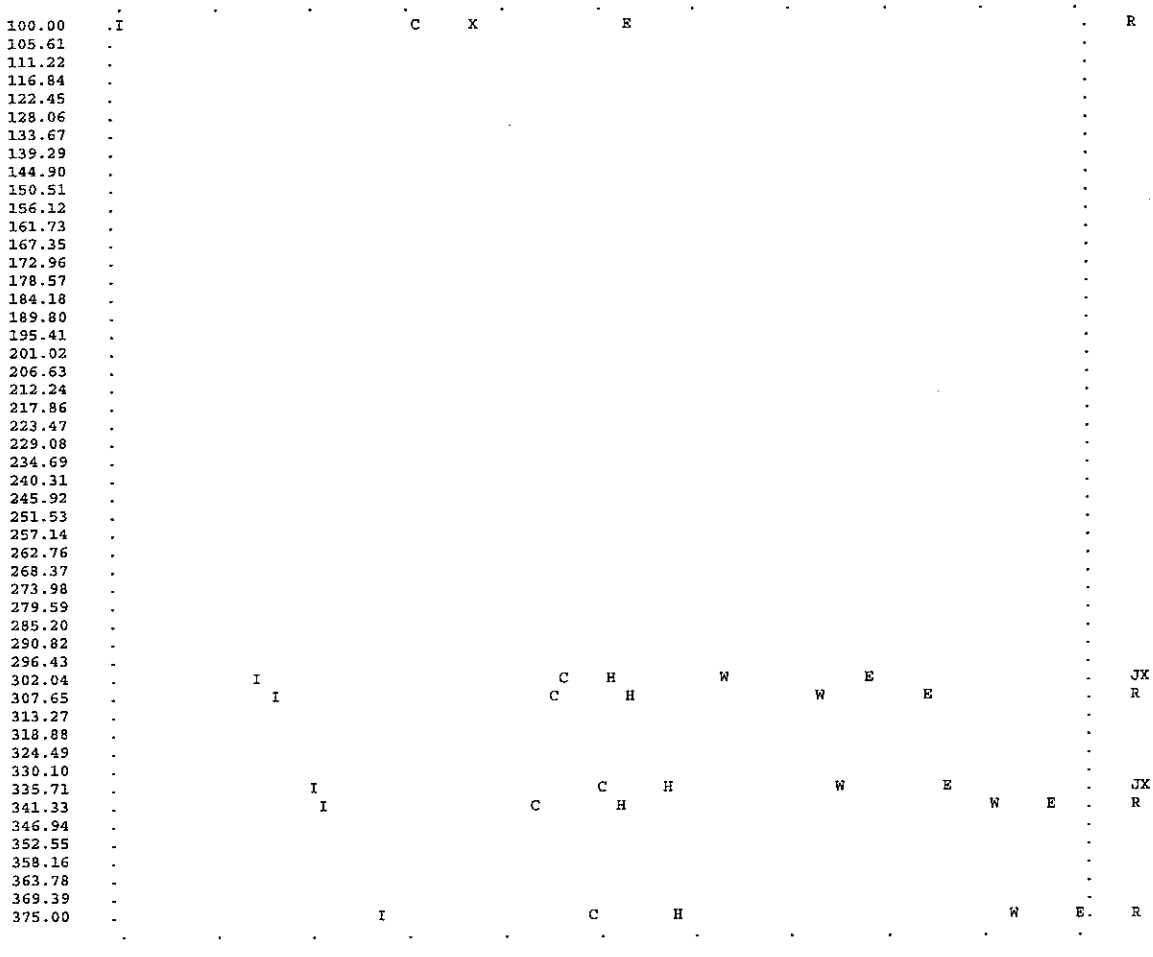
LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

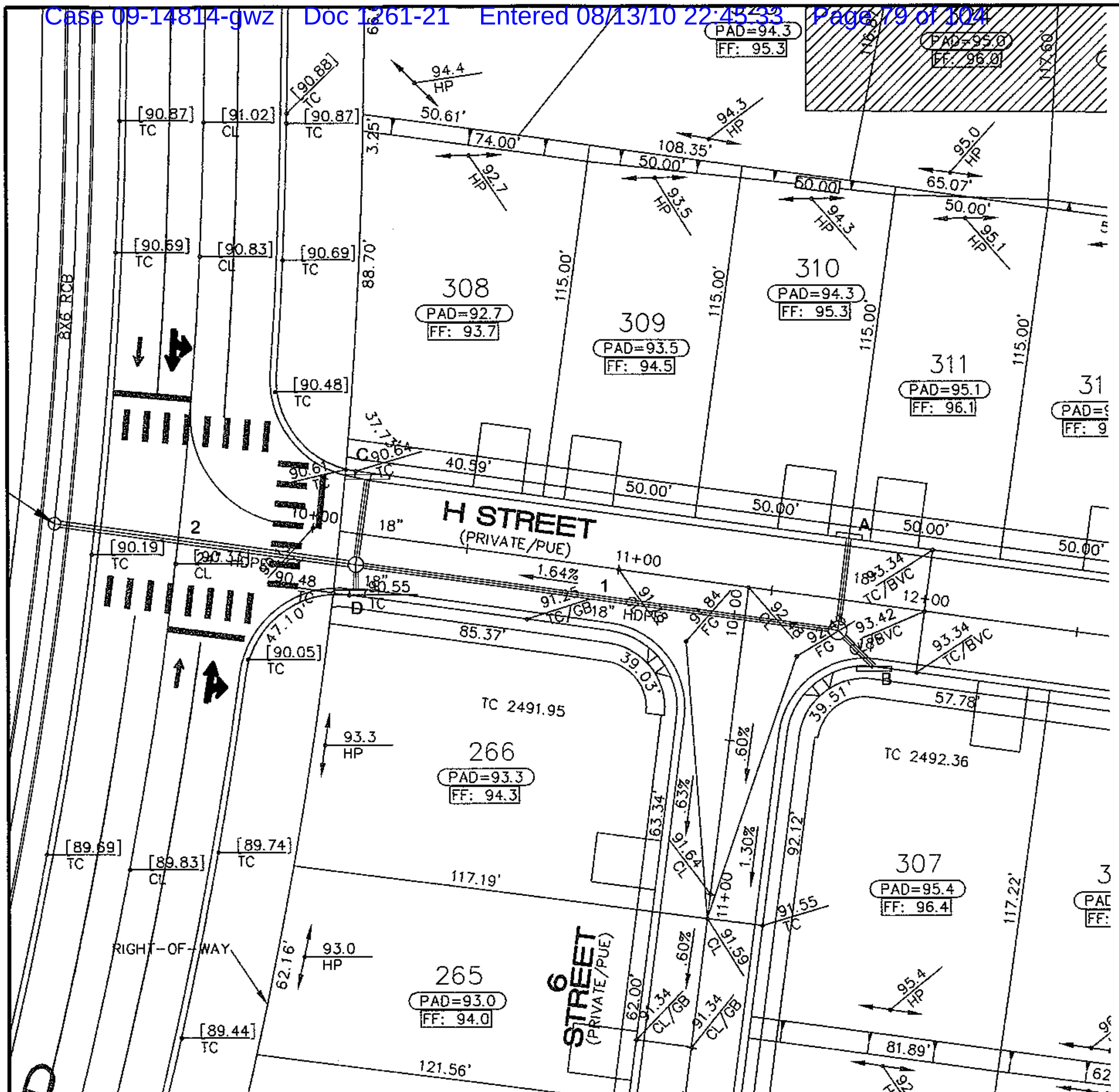
GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH 96 CFS IN POD 2 - J-C17

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2482.05	3.060	2485.110	64.0	9.05	1.273	2486.383	0.00	2.570		3.00	0.00	0.00	0	0.00
202.00	0.00589					.009207	1.86			3.000			0.00		
302.00	2483.24	3.919	2487.159	64.0	9.05	1.273	2488.432	0.00	2.570		3.00	0.00	0.00	0	0.00
JUNCT STR	0.02400					.007761	0.04						0.00		
307.00	2483.36	4.638	2487.998	53.0	7.50	0.873	2488.871	0.00	2.366		3.00	0.00	0.00	0	0.00
25.00	0.01520					.006314	0.16			1.751			0.00		
332.00	2483.74	4.444	2488.184	53.0	7.50	0.873	2489.057	0.00	2.366		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00800					.004038	0.02						0.00		
337.00	2483.78	5.683	2489.463	28.0	5.70	0.505	2489.968	0.00	1.804		2.50	0.00	0.00	0	0.00
38.00	0.01342					.004660	0.18			1.380			0.00		
375.00	2484.29	5.350	2489.640	28.0	5.70	0.505	2490.145	0.00	1.804		2.50	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH 96 CFS IN POD 2 - J-C17



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM

INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	8.5	27	8	19	G
B	11.5	27	11	16	G
C	11.5	19	8	11	G
D	11.5	16	7	9	G

SD PIPES

PIPE	Qpipe	Size
1	19	A
2	34	24

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 – PHASE B

H STREET
NODE J-C21

SCALE 1" = 50'

NO.	REV.
A	0

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

H STREET
NODE J-C21
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0074
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		27.000
T	Width of Spread (ft)		26.10

Gutter Flow

Eo	Gutter Flow Ratio		0.166
d	Depth of Flow (ft)		0.62
V	Average Velocity (ft/sec)		3.92

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	40.16	4.25	0.06	1.635	25.365
Parallel Bar P-1-7/8	1.50	2.88	0.27	6.793	18.572
Combination			0.31	8.428	18.572

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

H STREET
NODE J-C21
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

		Composite
S	Cross Slope Longitudinal Slope (ft/ft)	0.0074
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	27.000
T	Width of Spread (ft)	26.10

Gutter Flow

Eo	Gutter Flow Ratio	0.166
d	Depth of Flow (ft)	0.62
V	Average Velocity (ft/sec)	3.92

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	40.16	5.75	0.06	1.635	25.365
Parallel Bar P-1-7/8	1.50	4.38	0.39	9.772	15.592
Combination			0.42	11.408	15.592

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

H STREET
NODE J-C21
INLET C

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0164
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		19.000
T	Width of Spread (ft)		19.51

Gutter Flow

Eo	Gutter Flow Ratio	0.226
d	Depth of Flow (ft)	0.49
V	Average Velocity (ft/sec)	4.90

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	39.20	5.75	0.06	1.179	17.821
Parallel Bar P-1-7/8	1.50	4.38	0.38	6.725	11.096
Combination			0.42	7.904	11.096

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

H STREET
NODE J-C21
INLET D

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

			Composite
	Cross Slope		
S	Longitudinal Slope	(ft/ft)	0.0164
Sx	Pavement Cross Slope	(ft/ft)	0.0200
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.016
W	Gutter Width (ft)		1.50
a	Gutter Depression (inch)		2.00
Q	Discharge (cfs)		16.000
T	Width of Spread (ft)		18.25

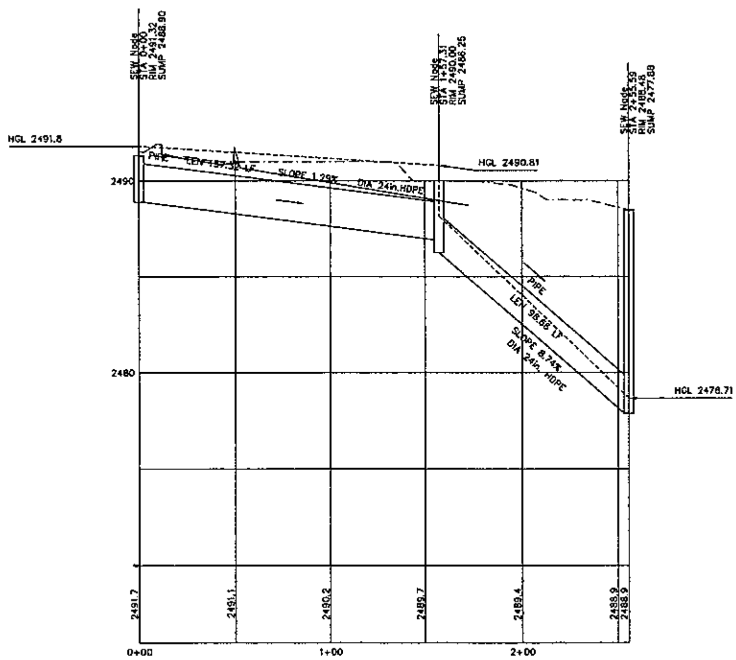
Gutter Flow

Eo	Gutter Flow Ratio	0.242
d	Depth of Flow (ft)	0.46
V	Average Velocity (ft/sec)	4.70

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	35.45	5.75	0.07	1.096	14.904
Parallel Bar P-1-7/8	1.50	4.38	0.40	5.971	8.933
Combination			0.44	7.067	8.933

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.



HS 1" = 100'
VS 1" = 10'

LEGEND	
— - —	Exisiting Grade
———	Finish Grade
- - - - -	HGL

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CADD A1-R3 © STANLEY CONSULTANTS

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM DRAWN RN CHECKED APPROVED APPROVED DATE DATE	RHODES VALLEY ARIZONA GOLDEN VALLEY RANCH	H STREET NODE J-C21 DRAWING_TITLE	SCALE NO. A	REV. 0

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH FLOW 19 CFS J-C21 STA 85 + WLPR

DATE: 3/20/2006
TIME: 8:18

F0515P

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	24	4			2.00														
CD	30	4			2.50														
CD	18	4			1.50														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2474.18	24	2481.88

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	193.00	2486.25	24	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	198.00	2486.90	24	18	18	0.013	8.0	7.0	2486.90	2486.90	90.00	90.00

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	350.00	2488.93	24	0.013	0.00	0.00	0.00	0

ELEMENT NO 5 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	350.00	2488.93	24	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH FLOW 35CFS J-C21

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2474.18	7.700	2481.880	34.0	10.82	1.818	2483.698	0.00	1.911		2.00	0.00	0.00	0	0.00
26.12	0.12979					.022588	0.59			0.900			0.00		
126.12	2477.57	4.907	2482.478	34.0	10.82	1.818	2484.296	0.00	1.911		2.00	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
126.12	2477.57	0.996	2478.567	34.0	21.75	7.348	2485.915	0.00	1.911		2.00	0.00	0.00	0	0.00
6.27	0.12979					.089790	0.56			0.900			0.00		
132.39	2478.38	1.007	2479.390	34.0	21.44	7.136	2486.526	0.00	1.911		2.00	0.00	0.00	0	0.00
12.95	0.12979					.082740	1.07			0.900			0.00		
145.34	2480.07	1.046	2481.111	34.0	20.43	6.483	2487.594	0.00	1.911		2.00	0.00	0.00	0	0.00
9.65	0.12979					.072956	0.70			0.900			0.00		
154.99	2481.32	1.087	2482.404	34.0	19.48	5.895	2488.299	0.00	1.911		2.00	0.00	0.00	0	0.00
7.54	0.12979					.064385	0.49			0.900			0.00		
162.53	2482.30	1.130	2483.425	34.0	18.58	5.360	2488.785	0.00	1.911		2.00	0.00	0.00	0	0.00
6.06	0.12979					.056871	0.34			0.900			0.00		
168.59	2483.08	1.175	2484.258	34.0	17.72	4.874	2489.132	0.00	1.911		2.00	0.00	0.00	0	0.00
4.97	0.12979					.050296	0.25			0.900			0.00		
173.56	2483.73	1.223	2484.950	34.0	16.89	4.430	2489.380	0.00	1.911		2.00	0.00	0.00	0	0.00
4.14	0.12979					.044540	0.18			0.900			0.00		
177.70	2484.26	1.273	2485.537	34.0	16.11	4.028	2489.565	0.00	1.911		2.00	0.00	0.00	0	0.00
3.46	0.12979					.039507	0.14			0.900			0.00		
181.16	2484.71	1.327	2486.040	34.0	15.35	3.659	2489.699	0.00	1.911		2.00	0.00	0.00	0	0.00
2.90	0.12979					.035130	0.10			0.900			0.00		

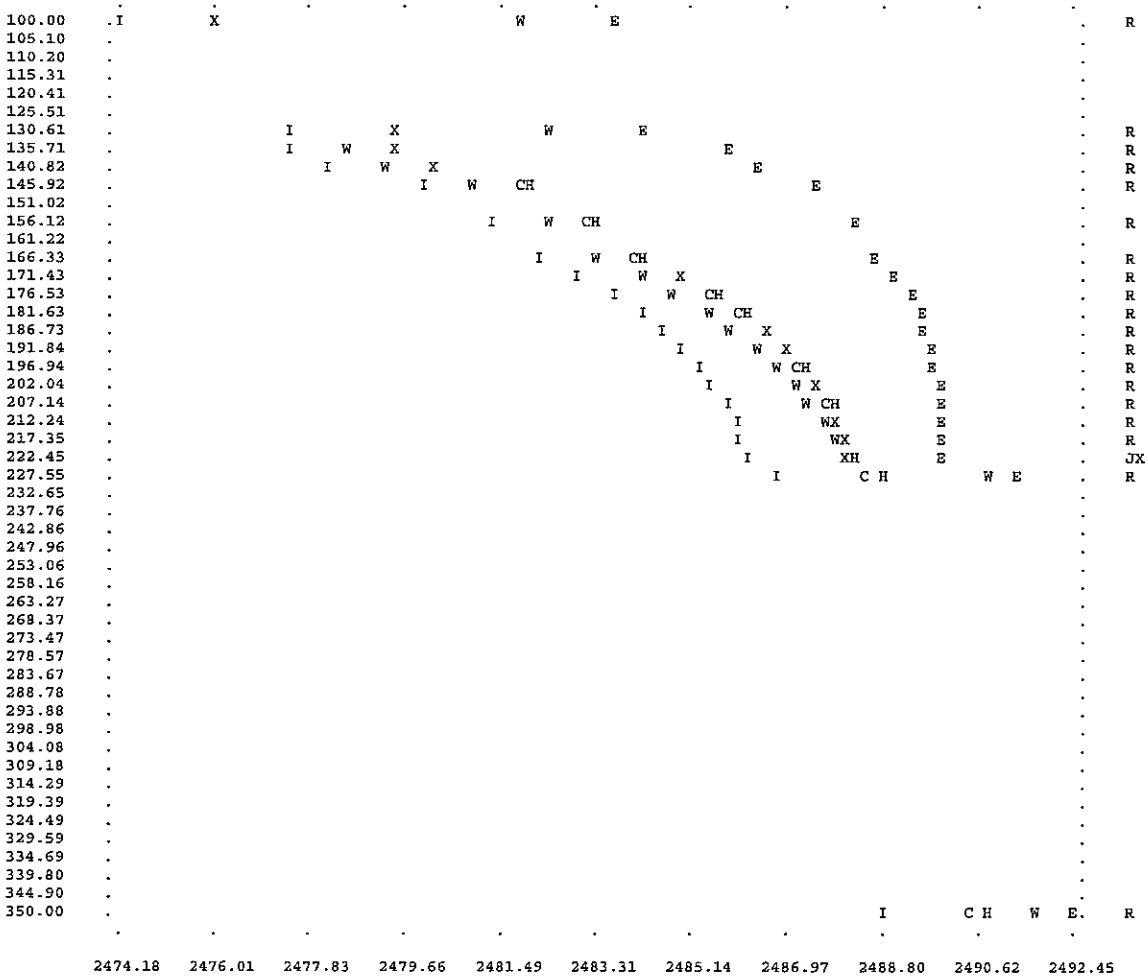
LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 2

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH FLOW 35CFS J-C21

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
184.06	2485.09	1.385	2486.475	34.0	14.64	3.326	2489.801	0.00	1.911		2.00	0.00	0.00	0	0.00
2.43	0.12979					.031331	0.08			0.900			0.00		
186.49	2485.41	1.448	2486.853	34.0	13.96	3.025	2489.878	0.00	1.911		2.00	0.00	0.00	0	0.00
2.05	0.12979					.028033	0.06			0.900			0.00		
188.54	2485.67	1.515	2487.186	34.0	13.31	2.750	2489.936	0.00	1.911		2.00	0.00	0.00	0	0.00
1.67	0.12979					.025198	0.04			0.900			0.00		
190.21	2485.89	1.590	2487.478	34.0	12.69	2.499	2489.977	0.00	1.911		2.00	0.00	0.00	0	0.00
1.33	0.12979					.022829	0.03			0.900			0.00		
191.54	2486.06	1.675	2487.735	34.0	12.10	2.273	2490.008	0.00	1.911		2.00	0.00	0.00	0	0.00
0.98	0.12979					.020949	0.02			0.900			0.00		
192.52	2486.19	1.775	2487.962	34.0	11.53	2.065	2490.027	0.00	1.911		2.00	0.00	0.00	0	0.00
0.48	0.12979					.019878	0.01			0.900			0.00		
193.00	2486.25	1.911	2488.161	34.0	11.00	1.878	2490.039	0.00	1.911		2.00	0.00	0.00	0	0.00
JUNCT STR	0.13000					.013336	0.07						0.00		
198.00	2486.90	3.908	2490.808	19.0	6.05	0.568	2491.376	0.00	1.568		2.00	0.00	0.00	0	0.00
152.00	0.01336					.007054	1.07			1.262			0.00		
350.00	2488.93	2.950	2491.880	19.0	6.05	0.568	2492.448	0.00	1.568		2.00	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH FLOW 35CFS J-C21



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
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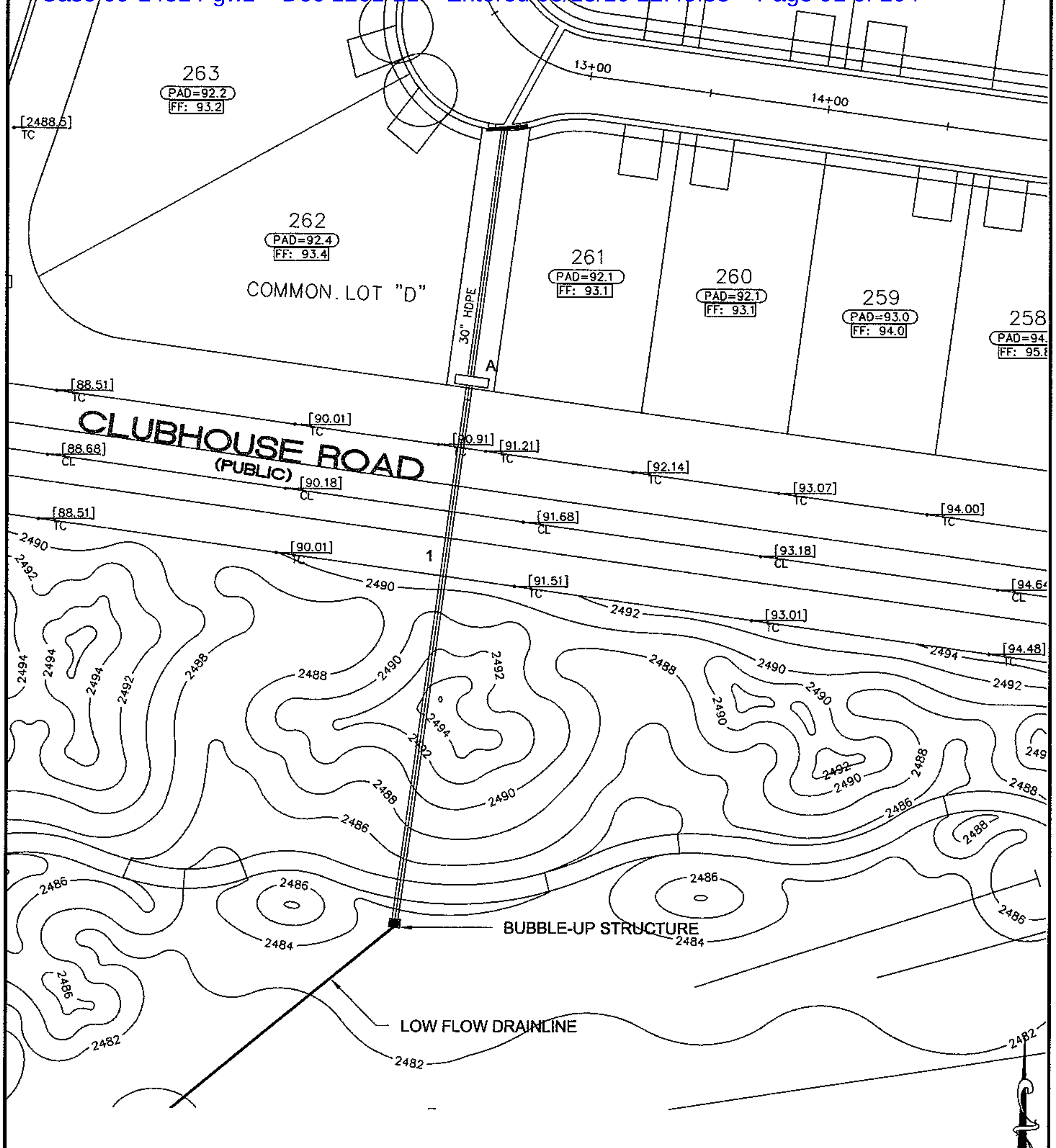
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



STORM DRAIN SYSTEM					
INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	14.5	73	12	61	S

SD PIPES		
PIPE	Qpipe	Size
1	12	A

REVISIONS	DWN	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RJM
CHECKED
APPROVED
APPROVED
DATE 3/02/06

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 - PHASE B

COMMON LOT D
NODE J-C25

SCALE 1" = 60'
NO. A
REV. 0

$$$$$$$$FILENAME$$$$$$$$$$$$ © STANLEY CONSULTANTS CADD A1-R3

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-14.5
DOOE J-C25 INLET A COMMON Lot "D"
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope	Composite/Dep
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	5.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.39
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	5.88
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.525
d_curb	Depth at Curb (ft)	0.671
Qi	Intercepted Flow (cfs)	12.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT D - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	61.00	cfs

Results		
Depth	0.85	ft
Flow Area	20.6	ft²
Wetted Perimeter	48.76	ft
Top Width	48.73	ft
Critical Depth	0.77	ft
Critical Slope	0.008000	ft/ft
Velocity	2.96	ft/s
Velocity Head	0.14	ft
Specific Energy	0.98	ft
Froude Number	0.80	
Flow Type	Subcritical	

VELOCITY x DEPTH.

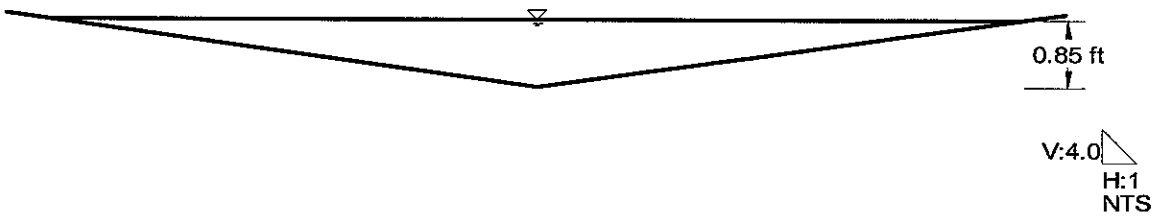
3.0 x 0.9 = 2.7 < 6.0

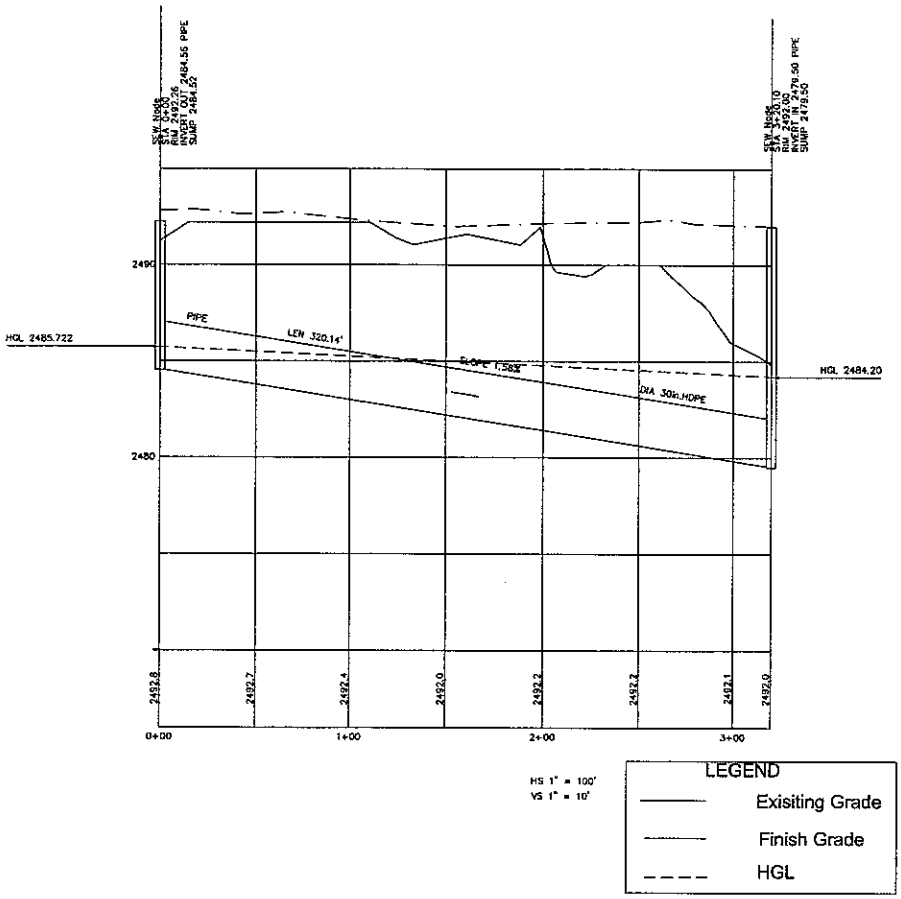
Cross Section

Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT D - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.020	
Channel Slope	0.005000	ft/ft
Depth	0.85	ft
Left Side Slope	28.80	H : V
Right Side Slope	28.80	H : V
Discharge	61.00	cfs





REVISIONS	APVD	APVD	APVD	DATE

Stanley Consultants INC.

DESIGNED RJM
DRAWN RN
CHECKED
APPROVED
APPROVED
DATE

RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 - PHASE B

COMMON LOT D
NODE J-C25

SCALE 1:1

NO.	REV.
A	0

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

6 STREET TO GOLF COURSE J-C25 IN POD1 12CFS

DATE: 3/14/2006
TIME: 13:23

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	30	4			2.50														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	100.00	2479.50	30	2484.20

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	420.00	2484.56	30	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	420.00	2484.56	30	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC. F0515P PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
6 STREET TO GOLF COURSE J-C25

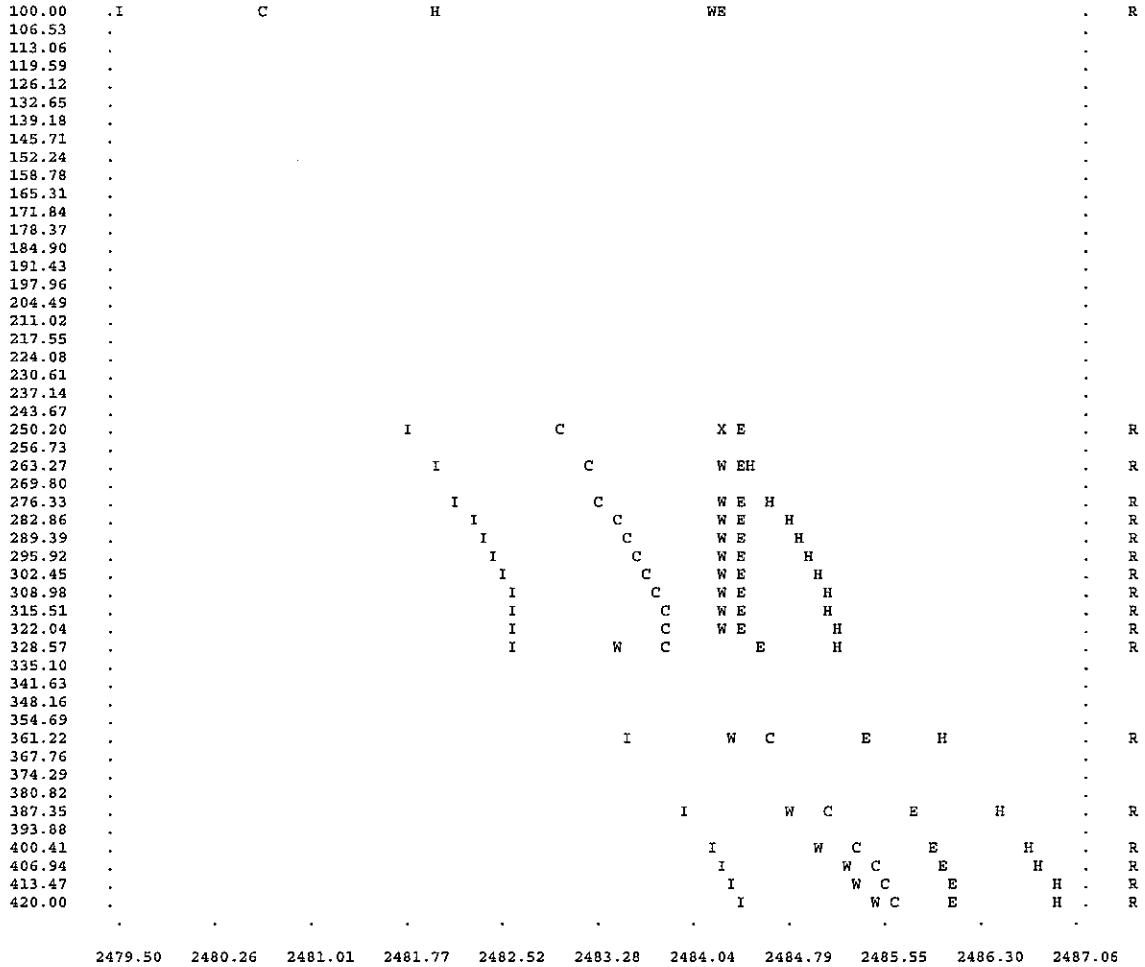
STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	2479.50	4.700	2484.200	12.0	2.44	0.093	2484.293	0.00	1.162		2.50	0.00	0.00	0	0.00
147.10	0.01581					.000848	0.12			0.820			0.00		
247.10	2481.83	2.500	2484.326	12.0	2.44	0.093	2484.419	0.00	1.162		2.50	0.00	0.00	0	0.00
14.76	0.01581					.000795	0.01			0.820			0.00		
261.86	2482.06	2.268	2484.327	12.0	2.56	0.102	2484.429	0.00	1.162		2.50	0.00	0.00	0	0.00
8.29	0.01581					.000775	0.01			0.820			0.00		
270.15	2482.19	2.133	2484.323	12.0	2.69	0.112	2484.435	0.00	1.162		2.50	0.00	0.00	0	0.00
6.67	0.01581					.000839	0.01			0.820			0.00		
276.82	2482.30	2.022	2484.318	12.0	2.82	0.124	2484.442	0.00	1.162		2.50	0.00	0.00	0	0.00
5.68	0.01581					.000923	0.01			0.820			0.00		
282.50	2482.39	1.925	2484.311	12.0	2.96	0.136	2484.447	0.00	1.162		2.50	0.00	0.00	0	0.00
5.03	0.01581					.001024	0.01			0.820			0.00		
287.53	2482.47	1.837	2484.302	12.0	3.10	0.149	2484.451	0.00	1.162		2.50	0.00	0.00	0	0.00
4.44	0.01581					.001143	0.01			0.820			0.00		
291.97	2482.53	1.757	2484.292	12.0	3.25	0.164	2484.456	0.00	1.162		2.50	0.00	0.00	0	0.00
3.96	0.01581					.001280	0.01			0.820			0.00		
295.93	2482.60	1.683	2484.281	12.0	3.41	0.181	2484.462	0.00	1.162		2.50	0.00	0.00	0	0.00
3.54	0.01581					.001439	0.01			0.820			0.00		
299.47	2482.65	1.614	2484.268	12.0	3.58	0.199	2484.467	0.00	1.162		2.50	0.00	0.00	0	0.00
1.14	0.01581					.001551	0.00			0.820			0.00		
300.61	2482.67	1.594	2484.266	12.0	3.63	0.205	2484.471	0.00	1.162		2.50	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
6 STREET TO GOLF COURSE J-C25

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
300.61	2482.67	0.820	2483.492	12.0	8.57	1.139	2484.631	0.00	1.162		2.50	0.00	0.00	0	0.00
54.32	0.01581					.015065	0.82			0.820			0.00		
354.93	2483.53	0.842	2484.373	12.0	8.25	1.058	2485.431	0.00	1.162		2.50	0.00	0.00	0	0.00
27.57	0.01581					.013410	0.37			0.820			0.00		
382.50	2483.97	0.872	2484.839	12.0	7.87	0.961	2485.800	0.00	1.162		2.50	0.00	0.00	0	0.00
13.91	0.01581					.011754	0.16			0.820			0.00		
396.41	2484.19	0.903	2485.090	12.0	7.50	0.875	2485.965	0.00	1.162		2.50	0.00	0.00	0	0.00
8.63	0.01581					.010304	0.09			0.820			0.00		
405.04	2484.32	0.935	2485.258	12.0	7.16	0.795	2486.053	0.00	1.162		2.50	0.00	0.00	0	0.00
5.65	0.01581					.009036	0.05			0.820			0.00		
410.69	2484.41	0.969	2485.382	12.0	6.82	0.723	2486.105	0.00	1.162		2.50	0.00	0.00	0	0.00
3.89	0.01581					.007928	0.03			0.820			0.00		
414.58	2484.47	1.004	2485.478	12.0	6.50	0.657	2486.135	0.00	1.162		2.50	0.00	0.00	0	0.00
2.57	0.01581					.006960	0.02			0.820			0.00		
417.15	2484.51	1.041	2485.556	12.0	6.20	0.597	2486.153	0.00	1.162		2.50	0.00	0.00	0	0.00
1.68	0.01581					.006111	0.01			0.820			0.00		
418.83	2484.54	1.079	2485.621	12.0	5.91	0.543	2486.164	0.00	1.162		2.50	0.00	0.00	0	0.00
0.90	0.01581					.005369	0.00			0.820			0.00		
419.73	2484.56	1.119	2485.675	12.0	5.64	0.494	2486.169	0.00	1.162		2.50	0.00	0.00	0	0.00
0.27	0.01581					.004712	0.00			0.820			0.00		
420.00	2484.56	1.162	2485.722	12.0	5.37	0.448	2486.170	0.00	1.162		2.50	0.00	0.00	0	0.00

GOLDEN VALLEY RANCH
GOLDEN VALLEY
6 STREET TO GOLF COURSE J-C25



N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

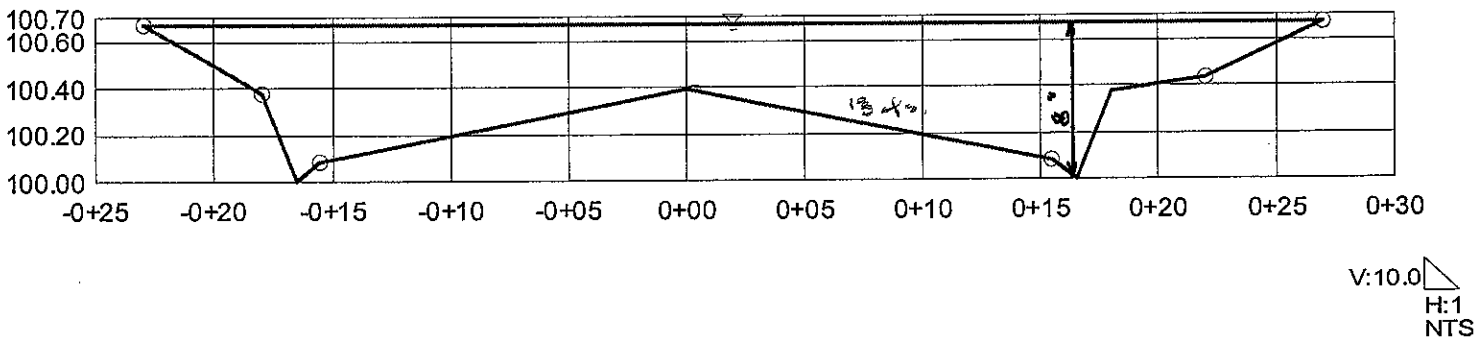
APPENDIX C

STREET CAPACITY (LOCAL STREETS)

Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	Local Str 50'Pl
Flow Element	Irregular Chan
Method	Manning's For
Solve For	Discharge

Section Data		
Mannings Coefficie	0.014	
Channel Slope	0.005000	ft/ft
Water Surface Elev	100.67	ft
Elevation Range	0.00 to 100.67	
Discharge	68.88	cfs



Stanley Consultants, Inc
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Table

Rating Table for Irregular Channel

Project Description	
Worksheet	Local Str 50'Pl
Flow Element	Irregular Chan
Method	Manning's For
Solve For	Discharge

Input Data	
Water Surface Elev	00.67 ft

Options	
Current Roughness Meth	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Attribute	Minimum	Maximum	Increment
Channel Slope (ft/ft)	0.005000	0.020000	0.000100

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.005000	68.88	3.73	18.5	50.12	50.00
0.005100	69.57	3.76	18.5	50.12	50.00
0.005200	70.25	3.80	18.5	50.12	50.00
0.005300	70.92	3.84	18.5	50.12	50.00
0.005400	71.59	3.87	18.5	50.12	50.00
0.005500	72.25	3.91	18.5	50.12	50.00
0.005600	72.90	3.94	18.5	50.12	50.00
0.005700	73.55	3.98	18.5	50.12	50.00
0.005800	74.19	4.01	18.5	50.12	50.00
0.005900	74.83	4.05	18.5	50.12	50.00
0.006000	75.46	4.08	18.5	50.12	50.00
0.006100	76.09	4.12	18.5	50.12	50.00
0.006200	76.71	4.15	18.5	50.12	50.00
0.006300	77.32	4.18	18.5	50.12	50.00
0.006400	77.93	4.22	18.5	50.12	50.00
0.006500	78.54	4.25	18.5	50.12	50.00
0.006600	79.14	4.28	18.5	50.12	50.00
0.006700	79.74	4.31	18.5	50.12	50.00
0.006800	80.33	4.35	18.5	50.12	50.00
0.006900	80.92	4.38	18.5	50.12	50.00
0.007000	81.51	4.41	18.5	50.12	50.00
0.007100	82.09	4.44	18.5	50.12	50.00
0.007200	82.66	4.47	18.5	50.12	50.00
0.007300	83.23	4.50	18.5	50.12	50.00
0.007400	83.80	4.53	18.5	50.12	50.00
0.007500	84.37	4.56	18.5	50.12	50.00
0.007600	84.93	4.60	18.5	50.12	50.00
0.007700	85.48	4.63	18.5	50.12	50.00
0.007800	86.04	4.66	18.5	50.12	50.00
0.007900	86.59	4.69	18.5	50.12	50.00
0.008000	87.13	4.71	18.5	50.12	50.00
0.008100	87.68	4.74	18.5	50.12	50.00
0.008200	88.22	4.77	18.5	50.12	50.00
0.008300	88.75	4.80	18.5	50.12	50.00